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Bulletin 50 March 1902

HORN AND BONE IMPLEMENTS

OF THE

NEW YORK INDIANS

BY WILLIAM M. BEAUCHAMP S.T.D.

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Bulletin 50 March 1902

HORN AND BONE IMPLEMENTS

OF THE

NEW YORK INDIANS

PREFACE

It was expected that corrections and additions relating to the matter of these bulletins would be made from time to time, as these publications were intended to impart knowledge and call forth more. Among other traces of aboriginal occupation I have thus recently learned of camp sites extending some miles east of Pulaski, on the higher lands along the Salmon river. These were to be expected there, and they have the usual early relics. In the vicinity of New York, M. Raymond Harrington has successfully explored a number of rock shelters in Westchester county, and at Port Washington on Long Island he opened about 100 pits containing human and canine remains. I have also observed and located 50 of the Perch river mounds, to be described later. They are the same type as those of the Bay of Quinté. A trip to the Susquehanna in the summer of 1901 allowed a brief examination of the great shell heaps of Unio complanatus there, and secured a plan of Spanish hill. Some new sites have been examined there and elsewhere at my own expense.

S. L. Frey properly corrects an error of names. There was a large recent site at Fort Plain; but the Canajoharie of Johnson's day was at Indian Castle, Herkimer co. Names of villages often followed them in removals. Mr Frey also agrees with Gen. Clark in placing *Andagoron* half way between Sprakers and Auriesville.

Smithsonian Institution

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He greatly deplores the fact that so many small yet valuable collections are being bought up and taken from the state. I hope that contemplated field work may soon increase our knowledge of town and camp sites. My thanks are due to many who have invited me to share in their explorations.

There are some things to add to what has been said of articles of polished stone. Mention has been made in a preceding bulletin of a fine, perforated stone ball, having a surface groove parallel to the perforation. This is from Genesee county and belongs to the state museum. I have since seen another fine example, found in Chautauqua county. To these may now be added a similar, but rarer form, heretofore reported only in Ohio. It is a flattened ball of polished gneiss, the short diameter being $1\frac{5}{8}$ inches, and the long $2\frac{1}{8}$ inches. The perforation is through the short diameter, and parallel to this, the surface is flattened, nearly a third of the long diameter being removed. It was found about 50 years ago in Marshall, Oneida co.

The long, slender and often double-pointed celts may now be assigned to the 16th century and the Iroquois, examples having been found on the Christopher site in Pompey. The flattened and constricted stone pipes, most nearly represented among the articles of polished stone by fig. 112, are now conclusively proved to belong to the 17th century, as before asserted. One with a perforated base was recently found in a grave at Brewerton, associated with European articles.

Visits to various sites and collections have added much to a knowledge of New York earthenware. Jefferson county is rich in pottery of bold designs, and vessels with handles and projecting beaks occur there. Excavation shows many new patterns and features. On Chaumont bay I dug up a little of the curious pottery which is partly ornamented by making an incision within, producing a small circular boss on the outside by pressure. This is not common even there. Some of the vessels have a bright look, caused by mixing a quantity of yellow mica with the clay. This is occasional elsewhere. In that county I have observed small rude faces on some clay vessels, and a rude attempt at a nose in connection with the three conventional circles.

In the bulletin on earthenware fig. 124 is of a vessel having a point in the center of the base. Thus it was figured and expressly described in a New York paper. W. L. Calver doubted the correctness of the statement, but could not at the moment obtain full access to the vessels. He has now changed his opinion. In a letter to me, dated Ap. 26, 1901, he says that a friend, in digging at Port Washington, "got a whole pot which had a pointed base." This form will therefore now hold the place claimed for it. I may add that the pointed base of a broken vessel has also been found in Jefferson county.

In treating of wampum, I regret not mentioning Horatio Hale's *Four Huron wampum records*, published with notes by Prof. E. B. Tylor of Oxford Eng. in 1897. I have not seen it; but one belt, in his opinion, showed an alliance between four nations, represented by squares. An older broken belt had a central diamond, so frequently used. This is "between a bird and a quadruped and three crosses with a circle (diamond) uniting their branches." These are all recent symbols. I merely call attention to these belts now, as doubtful opinions have been founded on them. Some fine ceremonial wampum has recently come into my hands, one call for a religious council still having the tally-stick attached. Mr Wyman also obtained some fine Ottawa belts in the spring of 1901, and the following summer Mrs Converse secured a large Canadian belt for one of her friends. I secured descriptions of all.

Mention may also be made of two fine belts belonging to the Douw family of Poughkeepsie N. Y. One is 2 feet long, 3 inches wide and has nine rows of white beads, crossed by four double diagonal lines of dark beads. This was a condolence belt, given by the Indians to Volckert Pieter Douw, on the death of his daughter in 1775. That year Mr Douw was a commissioner to treat with the Six Nations, and they returned one belt which he presented. I think this the second belt. It is on twine, has 10 rows, is 2 feet long and 3½ inches wide, and has three central designs in dark wampum. I made a satisfactory reading of both, but this is conjectural.

W. M. Beauchamp

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HORN AND BONE IMPLEMENTS

Introduction

It is not usual to place implements of horn and bone among those first used by man; and yet there is no reason why they might not then have been common. Nothing should be inferred from their absence; for, while the harder articles of stone seem almost imperishable, those of bone soon decay, except under favorable conditions. They appear in the bone caves of France with early implements; and in Kent's cavern, England, elegant bone articles are found below the stalagmite. The artistic engravings on some of the early bone implements of France have a wonderfully modern look to the well trained eye, in spite of their well attested origin. All these were preserved under favoring circumstances. Those left unprotected quickly disappeared. Bearing this in mind, we can see that a sharp bone was as suggestive of use as a sharp stone to the primitive man, and the same remark applies to implements made of wood. The fact has been strangely overlooked, that thorns are natural awls and needles, and that hard wood knots preceded the stone-headed war club, that pointed sticks were the first fish spears, and that arrows, made entirely of wood were and still are used by some Indians of this land. The early tomahawk was but a hard wood club. A wood or bone age may thus even have preceded that of stone, leaving few or no memorials. They certainly coexisted.

In Evans's *Ancient stone implements, weapons and ornaments of Great Britain* are figures of Eskimo arrow flakers, with handles of fossil ivory and points of reindeer bone. In such cases bone preceded the stone which it formed into shape. Perforated tablets of bone, resembling American gorgets, had been found in Europe. Bone pins and needles were frequent, but this requires qualification. The pins represented would be called awls in America, and have no heads. Some needles have central perforations and double points, as with us, but others have terminal perforations in slightly expanded heads. Bone was used in England for chisels, beads and buttons; horn for axes, hammers, pickaxes, hoes and handles. In this work a figure is given of a bone harpoon from Kent's cave, which has barbs on both sides, but with a point differing from those

of New York. The *Epoch of the mammoth*, by Jam[illegible] all, shows a horn harpoon from Switzerland precisel[illegible] Onondaga county.

25 years ago it was a notable fact that most of the bone and horn implements in the Smithsonian institution were from the Pacific coast, and perhaps the majority are still. Few were known from New York and New England, where their historic use is well attested. Little had been done in systematic excavation, and most articles at hand were surface finds of stone. A change has taken place; and the last 10 years have added wonderfully to our knowledge of implements of bone and horn. Comparatively little has been done in the Algonquin fields of the eastern counties of New York, but many an Iroquois site has yielded large quantities of these. Usually they were too low in the ground to be reached by the plow, lying in the refuse heaps or the deep ash pits of early villages, but coming forth as bright and unimpaired as when lost centuries ago. What they were will appear as we proceed.

When Verazzano visited Long Island in 1524, as many suppose, he found the Indians using fish bones for arrowheads, but farther west they had those of stone. In 1620 arrows were used against the whites at Nantasket creek, Mass., tipped with brass, eagle claws and horn. In the first volume of the Massachusetts historical society's collections is an account of *New England's plantations*, written in 1629 by Rev. Mr Higgeson. He said: 'For their weapons they have bowes and arrowes, some of them, headed with bone, and some with brasse." Capt. John Smith said of the Virginia Indians: "Their hookes are either a bone, grated as they noch their arrows, in the forme of a crooked pinne or fish-hooke, or of the splinter of a bone tyed to the clift of a little sticke, and with the end of the line they tie on the bait." Loskiel mentions hoes made of the shoulder blade of the deer, and other quotations might be given.

In a letter to the writer in 1880, Prof. George H. Perkins of Burlington university, Vt., said: "We have no implements of bone in Vermont, but from the other side of the lake are some split bones that may have been used as awls, and one very fine barbed spear point." This was a harpoon, barbed on both sides. At a

Prof. Perkins found a fine but modern bone mask in Ver-
village sites are rare in that state, but excavations might reveal something. Bone awls appear in some Illinois mounds, but do not differ from eastern forms. Bone articles found at Hochelaga (Montreal) are precisely like those of New York and those of the old Huron country, near Georgian bay, are similar. Rarer forms have been obtained from the curious mounds about the Bay of Quinté. A one-sided harpoon from Manitoba is of a common New York type. Bone articles are rarer in Pennsylvania, perhaps through lack of excavation, nor are they common near the seacoast, where many things supply their place.

As most of the early visitors to New York were migrants, stopping but a few days or weeks in a place, the absence of bone implements on their camp sites is no proof that they had none. Destruction came in many ways. James E. De Kay, in his *Zoology of New York*, says, in speaking of the common deer:

It has often been a matter of surprise that, while so many horns are annually cast, so few are ever found. This is to be explained by the fact that, as soon as they are shed, they are eaten up by the smaller gnawing animals. I have repeatedly found them half gnawed up by the various kinds of field mice, so numerous in our forests.

It may be added that a friend recently found that mice had gained access to his bone articles and badly gnawed some which were centuries old. Besides this, mere camps did not produce sufficient ashes or carbonaceous matter to preserve perishable articles, while those of stone remained. They are not frequent in graves, but must be sought where fires have been long in use. The dumping places, bordering most Iroquois villages, yield many and some which are fine. Nothing preserves them so well as ashes, and these accumulated to a great depth where a fire burned for many years. In some circular lodges the floor was occasionally cleansed by drawing all accumulations to the edge of the lodge, and filling the center with fresh earth or gravel. This produced hut rings, and relics are to be expected near the border, not in the center. Where a village was edged with deep ravines, refuse was thrown down the banks, but sometimes a deep hole was found or formed and gradually filled. These have rich deposits.

The Iroquois had no regard for bones as sacred, but Canadian Indians venerated many, or at least were careful of them. Some would not eat the marrow of the backbone, this being bad for the back. The Jesuits said the Hurons considered "fish intelligent, and also the deer and elks." It is added: "This is why they do not throw the bones of the latter to the dogs, when they are hunting, or the fish bones of the former when they are fishing. Otherwise, upon the warning that the others would have of it, they would hide and not allow themselves to be taken." Some Algonquins gave their dogs no bones of beavers, female porcupines, or birds taken in snares, for the same reason, but burned them. It was best to throw the bones of a snared beaver into the river. All were collected with care. Bears bones were burned or buried under the hearth. Some Algonquins burned dry beaver bones to learn the source of pestilence.

The Iroquois were not fond of working in stone, though they did this well, but long maintained their liking for bone and horn. Occasionally they neatly carve such material yet. Some of their early articles have preserved that wonderful polish, which sometimes creates doubts in those who have not dug up such articles, as the writer himself has done. They are usually plain, but early decoration sometimes occurs. The smoothness of the work is often surprising, and the luster may have come from the absorption of fat. The relative abundance of bone articles on early Iroquois sites is another subject worthy of remark, but this appears only through excavation. On many of those over 300 years old more tools or ornaments of bone than of stone will be found; nor is this proportion confined to those of established age and origin. The writer and four others did a successful day's digging at an early fishing village in Jefferson county, and he found the only flint arrowhead which was secured. Nearly all the other relics were fragments of pottery and pipes, and various forms of polished bone. Another prolific village site in Onondaga county has a similar character, chipped stone implements being exceptional, and those of bone the rule. Yet fine triangular arrowheads and small basalt celts have recently been found there, but bone is more frequent.

While occasional examples in Europe might pass for those of

A[illegible]n by far the larger part are distinct in appearance. References will be made to some for comparison. In North America a division of districts might be made, but there is much uniformity of type in common articles. A bone awl from a cliff dweller's home may be in no way distinguishable from one made in New York. Village sites are the best places for determining the age and relations of bone articles. At fishing places, frequented by many visitors of different periods and families, the numerous and fine remains of this kind rarely permit any orderly sequence to be assigned them.

It will be noticed that a large proportion of the bone articles here figured are from the central part of New York, the home of the Iroquois One reason for this is that the writer's own work has been mainly there, but a more important one is that this region is nowhere equaled in articles of this kind. Visits were made to some other places, and correspondence was had with good antiquarians, to see what additional matter could be secured. Moderate results were obtained, and some of interest, but all pointed to the fact that the early and late Iroquois, with their kindred, were the workers in bone *par excellence.* As these had some early hold on Lake Champlain, though no forts or towns, it was to be expected that something would be found there. The small and briefly occupied sites did not, however, produce sufficient preservative material for large results. A letter from Dr D. S. Kellogg of Plattsburg states the case there:

I don't know that I can add much to my *bony matter.* The most I have found was in fire heaps; among charcoal, ashes, fire stones, flint implements, celts and fragments of pottery. There are many awls or needles, and some very fine fragments of notched harpoons. The bones and teeth of different animals are quite numerous, and mostly broken. Deer horns are often found, and some of the tines look as if they had been used as punches.

A long resident population, large villages, and perhaps unusual skill, made the Iroquois home territory a treasure house of the articles now to be considered. They are abundant, fine, and in general remarkably well preserved.

Besides those authors more explicitly quoted in the following pages, reference may be made to some writers in the way of general distribution. Dr Henry Schliemann's *Ilios* has bone needles with

perforated heads, and small awls differing from those of New York, but some bone knives and large awls resemble ours. The Irish implements are quite different. In the *Lake dwellings of Switzerland*, Dr Keller figures a large awl much like some in New York. The needles shown are perforated at the end, but fig. 35 of plate 103 is suggestive of America, as well as a harpoon on that plate. Plates 5 and 20 also have harpoons resembling those of New York. In the *Antiquities of the southern Indians*, Mr Jones figures some of the frequent bone gouges, but they differ from the few found here. Prof. T. H. Lewis of St Paul Minn. has found the blunt bone implements here called punches; and his descriptions of awls and harpoons are like those farther east. A bone fishhook has been found in Illinois. In general the whole territory from the upper Mississippi eastward to New York and the ocean may be considered one district with local variations.

Awls and knives

It is quite probable that many small bone articles commonly called awls were really used as arrow points, and some have regarded the large and sometimes massive forms as daggers. In the paucity of stone arrowheads and knives on many Iroquois sites of the 16th century, such uses seem reasonable, and have much to support them in the notes of early discoverers. No special classification of these pointed tools will be attempted here, but the reader will see that some would have been very effective as warlike weapons. This would appear more clearly if all could be represented here in actual size. A few are reduced for illustration, and many of the large forms are omitted because just as well shown by smaller examples. Frequent small awls are also found which are but sharpened splinters of bone, as well described by words as figures. The outline of the tool often means nothing. The point of the awl is the only essential thing. In considering the better finished articles of all kinds, it is to be remembered that these are but a selection of typical forms out of thousands which have individuality, constantly varying in one way or another.

Then there are forms which have a rounded point, not adapted for piercing or any other known purpose. These are usually of

horn, and are commonly classed with awls, though often termed punches. It may be best to assign them this name here, though this places them with cylindric articles usually having rounded ends. While they differ much in form from these, they seem to belong nowhere else; and even then we do not know their use.

While a warlike character has been contended for in the case of some of the larger and longer forms, some persons have seen in the more slender examples pins, either for the hair or apparel. The latter supposition is questionable in most cases; and those of great length and sharpness would have been neither comfortably nor safely worn in the hair. Some may be assigned to this use. Many combine a broad, knifelike form with the sharp point of an awl, if such they are. They seem not sharp enough for cutting, but would have been useful in skinning any animal. Among the Iroquois stone axes or celts were not abundant, and were probably prized. For deer-skinning the bone knife did just as well. It was lighter, more easily made, was sometimes distinct, but often combined the awl point with it, as our pocket knives practically do.

While the so called awls were often made of small splinters of bone, the larger ones often left some natural feature almost untouched. The jawbone of some animal would be sharpened, the teeth perhaps being still in place, but this is rare. Long awls quite commonly leave one joint almost unaltered. This is a frequent feature of smaller forms. The bills of water birds were often utilized, and fish spines required but moderate change, some none at all. Most of these will be illustrated here, but the diversity of form is endless.

We need not raise the question whether the sharpened splinter, requiring a handle, or the larger implement requiring none, had priority in time. Here they coexist, but it may be advantageous to treat them separately, as far as it can be done. Yet many large awls are formed from splinters, and small ones occur with one joint, almost or quite unaltered. Another evident distinction will be found between flat and cylindric awls, and between these and the frequent and fine three-sided forms. These distinctions are convenient in description, but have no other value. The maker simply fashioned the awl according to the original form of the bone. There

are a few exceptions to this. Little need be said in regard to the mode of forming awls, so simple was the process. Examples will be given of the progressive stages of less common implements. The smaller awls may be described first.

Fig. 1 is a very sharp implement, and much thicker than most of this size. The broad end is neatly finished, and near that end there is a distinct groove on the convex side. This may have secured it more firmly to a handle. It is not as much rounded as most of its class, but has well defined angles. It comes from the fort west of Cazenovia, and is about 300 years old. On that site many bone implements have been found. Fig. 2 is from the same place, and was found by the writer. It is both sharp and slender, and the notch on one side may also have been for attachment. The longitudinal groove is natural, and the base is unfinished, as in most examples of this kind.

Fig. 6 is a curved awl, quite slender and nearly cylindric. The base is rounded and has four grooves. From its finish and ornamental character, it may have been a hairpin. It is from a prehistoric site in Pompey.

Fig. 10 was in Dr. Hinsdale's collection, and was found by him on the site last mentioned. This was a considerable town on a hill in Pompey, where many beautiful articles of bone and horn have been discovered in the ashes. It is a short and not very thick bone, flat on one side and a little rounded on the other. Both ends come to a sharp point. It may be said here that all the figures are of actual size unless otherwise noted, and that all articles are of bone when not described as horn. The latter are comparatively few in proportion. Fig. 11 is from the same place, and is a fine flat bone, sharp and highly polished. The base is neatly indented. Fig. 22 was found near it, and is a good representative of a large class where some original outline of the bone remains. Jaws of animals are often worked merely to a sharp point, and the beaks of birds are naturally ready for use.

Fig. 23 is from the fort west of Cazenovia, usually placed at the end of the 16th century. It is a narrow cylindric and tubular bone, smoothly cut at one end and beveled at the other. It is a frequent form, and some have thought it a primitive arrow point.

Fig. 24 is from the prehistoric town in Pompey, already mentioned, and known to local collectors as the Christopher site. By this name it will be designated in further descriptions. It may be a flat awl, but the form and side notches would be appropriate for an arrowhead. The base is neatly rounded, and it may have been an ornament. This would explain its high polish, which would hardly be expected were it simply the point of an arrow.

Fig. 25 is a handsome awl from the fort west of Cazenovia, locally known and hereafter designated as the Atwell site. It is thin and sharp. The under side is concave, retaining this natural feature. The upper is flat and a little angular. Fig: 27 is a very small cylindric awl, with a rounded base, found by Dr Hinsdale at Brewerton. Many of Dr Hinsdale's articles are now in the state museum. Several examples of this kind are known, but it is not a frequent form. They are usually larger.

Fig. 45 might be classed with awls, but the angular and grooved projection at the base suggests its use as a pick. The pointed portion is cylindric. This is from the Christopher site.

Fig. 49 is another of the double-pointed, flat awls. It is quite thick and a very fine specimen of this form. It was found by Dr A. A. Getman in the vicinity of Chaumont bay, Jefferson co., where bone and horn relics abound. Fig. 67 presents a similar outline, but is slightly gougelike at one end. It is of moderate thickness and quite white. It was found by Luke Fitch of Pompey, on the Christopher site, and is now in the Bigelow collection at Baldwinsville, with many others from that spot. Bone articles there have been finely preserved in ashes.

Fig. 69 is from Dr Getman's collection. His many fine articles are from several sites in the vicinity of Chaumont bay, but several miles apart. This fine and sharp awl is nearly flat on one side, but rounded on the other. One edge is also broadly angular, and the other curved.

Fig. 71 was found by Dr William G. Hinsdale of Syracuse, on the Sheldon fort site, lot 69, Pompey. This may have been occupied about 1630, and has many European articles. It is a sharp implement of deer horn, cylindric toward the point and somewhat flattened near the base. This is neatly rounded, and there is an

indentation on each side above. For a considerable time Dr Hinsdale made a specialty of bone and horn implements, and was very successful in collecting them on early sites.

Fig. 76 is a very slender and curved awl, with a sharp point and a neatly rounded base. It is polished all over, and much more curved than usual. This was found by Oren Pomeroy near Chaumont bay. He has many fine articles of bone and horn. Fig. 74 is a very slender bone awl from Pompey. The form is not rare.

Fig. 80 is in the collection of the Buffalo academy of science, and was found in or near that city. It is worked all over, and at first suggests an unfinished hook. The two sharp points would be unnecessary in that case, but it might have been attached to a wooden shank and used in this way. On the other hand, the longitudinal grooves favor the idea that the ultimate intention was to cut it in two, thus making two small awls. The article is unique in its present form.

Fig. 81 is a fine and flat awl found by the writer at the mouth of Perch river, Jefferson co., in 1899. It is moderately curved. The site is an early one, and yields much in pottery, bone and horn, and but little in stone. Fig. 82 is from the same county but not the same place. The double points suggest an awl, but are not very sharp. It may have been a pin. The indented center also suggests another use, that of a fishing implement made by some primitive peoples, but more cylindric than this. In that the line was attached to the center, the bone brought parallel to the line and covered with the bait. When this was swallowed, a jerk brought the implement across the throat, and secured the fish. The Eskimos use these for catching waterfowl. Dr Getman has the center of a similar article more angularly indented.

Fig. 104 is a flat, triangular and perforated piece of bone, of small size and sharp at both ends. It may have been used in several ways, as an awl, an arrowhead, or the point of a fishhook. It is from the Atwell fort, and is in the collection of J. H. T. E. Burr of Cazenovia, who has many interesting articles from this site.

Fig. 121 might be called a needle but for its size. The form is generally triangular, but the point and base are rounded, the latter having three notches. It is quite flat and has an elliptic perforation

near the base. It is from Jefferson county. Fig. 125 is similar and from the same county, but differs in having a sharp point, a higher and circular perforation, and no basal notches. Fig. 127 is another perforated awl or needle, sharp at both ends, and having a central perforation. It is generally flat, but somewhat undulating in form, and may have been used in fishing, though rather large for this. It came from the fort south of Pompey Center, occupied about 1640. Fig. 122 is much like this, but shorter and broader. This fine article is nearly flat, and a little rounded on the upper side. The reverse is slightly concave, and both sides are polished. This is from the earlier and prehistoric Christopher site, and is now in O. M. Bigelow's collection at Baldwinsville. Fig. 261 is in the same collection, and is a very fine bone awl from the Seneca river north of Weedsport. It is somewhat angular, and the points at each end are rounded. The color is dark brown, and it was probably colored and preserved by iron in the soil. Fig. 271 is a half round and slender bone awl from the Atwell fort. It is worked all over and pointed at both ends. It is a fine and not very rare form, having one slender and one obtuse point. Fig. 275 is from the same place, and is a little wider, and with a more obtuse basal point.

Fig. 302 is a unique form, curved, and having four notches on each side near the rounded base. It may have been used as a hair-pin or for ornament, and is quite slender. This was found by Dr R. W. Amidon of New York city, at Point Peninsula in Jefferson county. While summering on Chaumont bay, he has done much valuable work and collected many fine articles. Fig. 315 is from the same collection, and was found in the vicinity of Chaumont bay. It is a small and flat implement, one end being pointed, and the other rounded and nearly like a chisel. Fig. 317 is also from the same collection, but is a frequent form on many sites, usually but slightly worked. It appears among European articles and is a bird bone.

These figures sufficiently represent the smaller forms of what are commonly called awls, but a few others may be mentioned. In later days the iron point replaced that of bone, and Aunt Dinah, the aged Onondaga squaw, had an iron awl with a cylindric handle of curved bone, 3½ inches long. This had transverse grooves, and much resembled some early bone beads. A fine and slender bone

awl comes from a site near Munnsville. Most of the relics there are of the historic period. In the Richmond collection is a nice awl from a burial mound (?) at Mannsville, Jefferson co., which is 3 inches long, and in the same collection is a curious flattened one of the same length. This is curved, having a single convex curve on one side, and two concave curves on the other. This comes from Madison county. Many fine and sharp awls have been found by Dr Hinsdale on what is called the *Kaneenda* site, north of Syracuse. Many also occur on the mixed sites at Brewerton. Dr Hinsdale also collected slender and flat awls on the Sheldon site, lot 69, Pompey. Among those from Brewerton is a fine double-pointed horn awl, 4½ inches long, and another of the same material, very slender and a little curved, not unlike a dentalium shell in outline. This is 1½ inches long. Another of bone is 2 inches long, curved, polished and very slender.

Fig. 44 is a sharpened fish spine from Brewerton. These are frequent and of many sizes. Fig. 70 was made from the bill of a sheldrake, and is from the Atwell site and in the L. W. Ledyard collection. These also are frequent, with the bills of other birds.

Among the larger awls, as we may call them for the sake of a name, many of the same forms appear, often grading into those which might be differently classed. Some which have a distinctly narrowed and sharpened point, have also broad blades suggestive of knives. Another use is even more probable. In the *League of the Iroquois*, p. 363, L. H. Morgan illustrates the "*gä-ne-u'-ga-o-dus-ha*, or deer horn war club." After describing the common club of hard wood, he says of the one just named:

> This species of war club was also much used. It was made of hard wood, elaborately carved, painted and ornamented with feathers at the ends. In the lower edge, a sharp-pointed deer's horn, about 4 inches in length, was inserted. It was thus rendered a dangerous weapon in close combat, and would inflict a deeper wound than the former. They wore it in the girdle. At a later period they used the same species of club, substituting a steel or iron blade resembling a spearhead, in the place of the horn. War clubs of this description are still (1851) to be found among the Iroquois, preserved as relics of past exploits. It is not probable, however, that these two varieties were peculiar to them; they were doubtless common over the continent. The tomahawk succeeded the war club, as the rifle did the bow.

The careful reader will find that the name of tomahawk was originally applied to a wooden weapon, and the arming of this with a cutting point was a step in the evolution of a formidable implement of war. Adopting Mr Morgan's statement, we can refer to this weapon some of the broader forms called awls, and particularly those horn points which are rounded rather than sharpened. To the latter we can assign no more probable use. The horn in his figure of a club has the curve of the antler prong. In the following descriptions a few of the broader forms will be classed as knives, though their use, strictly as such, may be considered doubtful.

Fig. 3 is a flat and sharp awl, generally wide, and expanding still more at the base. Within half an inch of this broad end are two transverse grooves, quite close together. It is finely polished, and came from the Nichols pond site in Madison county, the scene of Champlain's attack in 1615. It is now in the collection of A. H. Waterbury at Brewerton. Fig. 4 also belongs to him, and was found on the east side of the mouth of Chittenango creek, lying in the water. It is moderately broad, fine and sharp. For the most part the edges are parallel, but expand near the broad end into a well curved base.

Fig. 7 is a fine flat and narrow awl, perforated near the base. This came from the recent site in Rice's woods, east of Stone Arabia in Montgomery county. It is somewhat angular. Fig. 8 is a beautiful, very slender and symmetric awl, found east of the Canajoharie cemetery. It tapers from near the base, on either side, to the sharp point at one end, and abruptly curves to the obtuse point at the other. It is the largest of this form the writer has seen and is nearly or quite cylindric. Fig. 9 is in the Richmond collection, and came from Nichols pond. It is a slender and flat awl, with one side nearly straight, and the other curving outward so as to form a broad base.

Fig. 15 is fine and flat, tapering regularly from near the base to the point. The base is angular, the joint not having been fully worked down. Found on the Atwell site by Luke Fitch of Watervale. Most of his articles are now in the Bigelow collection, making further personal reference unnecessary. The next two articles were found by the same person at the same place. Fig. 16 is

another slender and long bone awl, tapering directly from a rather broad base to the sharp point. It is half round in section, and is polished all over. Fig. 17 is also half round, tapering from a wide center to each end. The base forms an obtuse point, and there is a deep notch on one edge just above it. A slight ridge extends from near the center to the sharp point.

Fig. 18 is a highly polished bone awl, found by Oren Pomeroy in the vicinity of Chaumont bay. The edges are parallel till near the point, and it has the common flat form. In one edge, just above the rounded base, is a notch, and above this several short and slight cuts. Fig. 19 is one of the prettiest of Mr Pomeroy's articles. It is broad near the center, regularly tapering to a sharp point at one end, and to a narrow rounded base at the other. It is nearly flat, but with rounded edges. Its polished surface has been beautifully mottled by fire, making it very attractive in appearance. A recent inspection showed that in two years its rich hues had greatly faded from exposure.

Fig. 20 is a long and nearly flat bone awl or pin; probably the latter, as the point is obtuse, and the base has transverse grooves as if for ornament. This is from the Christopher site in Pompey. Fig. 21 is from the same place, and is a fine flat implement, tapering from the broad base to the point.

Fig. 28 is a curious curved implement which may be called a large awl. It has been cut lengthwise more than half way along the edge, thus exposing the cavity of the bone. The point is but moderately sharp. It came from the Atwell site, and was in the Ledyard collection.

Fig. 29 is in Dr Getman's collection at Chaumont. It is a much curved, cylindric and pointed bone. The base is irregular and but very slightly worked. This was probably used in a war club. Fig. 30 is one of those forms mentioned, the point suggesting an awl, and the broader part a knife, or, perhaps still better, an instrument for skinning deer, as the parallel edges are rounded and not sharp. The rounded base is nicely worked, and the point is formed by a concave sweep on both edges. Dr Amidon found this near the village of St Lawrence, in Jefferson county. Fig. 37 may be compared with this, differing but little in outline. It is highly polished,

and is flat, with rounded edges which are not parallel. The base is broad and notched. It is from the Christopher site in Pompey, and is not a frequent form.

Fig. 31 is a beautiful article found by Dr Getman near Chaumont bay. The edges run in a straight line from near the rounded base to the sharp point. The base is deeply notched, and thence a narrow groove extends on one surface to the point. The implement is flat, and quite brown in color.

Fig. 32 is from the island at Brewerton, where so many fine bone articles have been found. It is a beautiful implement, worked all over, and while generally flat, it has beveled edges. There is a sharp point at each end, and it is less angular there. This is in the Waterbury collection, as is the next. Fig. 33 resembles the last, but is broader, shorter, and has but one point, while tapering toward the base.

Fig. 34 is a peculiar long and slender awl from what is called the Cayadutta fort site, in Fulton county. It has but one point, but the long shaft toward the base is unusually slender. Many fine bone articles have been found on this early site. This one is in the late A. G. Richmond's collection. The fort was probably occupied about 1600, or a little earlier.

Fig. 38 is a unique article from Brewerton, and is in the Waterbury collection. It seems part of a bear's lower jaw, cut down and sharpened for an awl, but with most of the teeth remaining. This is a rare feature.

Fig. 39 is a fine and sharp bone awl, nearly flat, which was found by G. W. Chapin of Fonda, at a site on Wemple creek, 3 miles north of the Mohawk river. It is a large, well finished and symmetric awl, 7 inches long, and therefore not of the very largest size. Mr Chapin found it in ashes, 18 inches below the surface. It has some grooves near the well wrought base. Thanks are due for the loan of this fine implement.

Fig. 40 is a remarkably fine example of a flat bone awl, approaching the knife form. It is widest in the middle, tapering regularly toward each end. Near the narrow and rounded base is a notch on each side. This is from Rice's woods, near Stone Arabia.

Fig. 41 is a fine example of a frequent form of bone awl, or pos-

sibly a dagger. The base does not suggest its use in a club, it is so thick. At that end the joint is neatly worked down, but not obliterated. Thence it tapers regularly on all sides to the sharp point. It is highly polished and is a large specimen of this class, being about 5½ inches long. It was found by Dr Hinsdale on the Christopher site. Most articles from this site were collected by Luke Fitch. Fig. 50 is another of these massive awls, if they may be called so, found by Dr Hinsdale at the Sheldon fort in Pompey. It is much like the last, but is both broader and shorter, and the base is less worked. Fig. 51 is another fine article of this class, from the Atwell fort. It is large, highly polished, and is worked almost all over. This is in the Burr collection. Fig. 295 is a much more slender example from the Christopher site, and now in the Bigelow collection. The base is left unworked. Fig. 325 is another massive example from Pompey in the same collection. It is 8¾ inches long, but is much reduced on this plate. It is well worked and somewhat curved. Near the point the cavity of the bone is exposed.

Fig. 46 is a double-pointed flat awl, ornamented with crosshatching, a somewhat unusual feature. This was from Jefferson county, and in the Twining collection, as was the next. Fig. 47 has an ornamentation of grooves, and three perforations toward the base, which is indented. The lower perforation is elliptic, and the others circular. The edges are slightly curved, one being concave.

Fig. 48 is a fine flat bone awl from Pompey, in the Bigelow collection. It is thick and highly polished, with a moderate ridge on one side. Fig. 54 is from the same place and in the same collection. It is thick and highly polished, with a very sharp point. There is a diagonal groove across the base, which may be natural.

Fig. 55 is a curved bone awl from Brewerton, somewhat flattened but having the edges rounded. It is partly hollow. This is in the Waterbury collection. Fig. 57 is a thin, flat, slender, and very sharp bone awl from Pompey, in the Bigelow collection. Fig. 59 is in the same cabinet, and is from the Christopher site. It is a much curved bone awl, broad in the center and pointed at both ends. The convex side is broadly grooved. The implement is triangular toward the broad end and flattened toward the narrow point. Fig. 68 is from the same place. It is a fine, sharp and slender awl,

ornamented with grooves near the base, and this feature suggests a pin. Fig. 116 is a fine flat bone awl, highly polished all over, and tapering from the broad base to the point. The reverse is slightly concave. From the same site as the last. Fig. 128 is from the same place, and is placed with the awls for convenience. It is a hollow and nearly cylindric bone, well worked, and beveled for more than half its length across the cavity of the bone, a rounded point being produced.

Fig. 312 is a fine and sharp bone awl, found by Dr Amidon in the vicinity of Chaumont bay. Some lines may be for ornament. One side is flat and the other angular. Fig. 334 is one of the finest bone awls seen by the writer. It is from the same region as the last, and was found by Oren Pomeroy. In the plate it is reduced, but is 8 inches long, quite straight on one side and but slightly emarginate on the other. It is cut down so that the natural cavity appears for two thirds of the length. The edges of this are highly polished, as is all the convex surface. It is very sharp, and for its size very slender.

Fig. 335 is a slender and flattened awl, $8\frac{3}{8}$ inches in extent. Both edges are curved, the one being convex and the other concave. The base is broad and convex, with a broad and curving notch toward the inside of the implement, which is much reduced in the plate. It was found on the border of Canajoharie village, in a grave which contained a very fine and perfect R. Tippet pipe of white clay, and is in the Richmond collection. Fig. 339 is a fine, long and slightly curved bone awl, found by Dr Hinsdale at the mouth of Chittenango creek. There is a small perforation near the tip. The width is quite uniform, but with a broader base, and the general surface is flat. In the plate it is reduced, being $8\frac{1}{8}$ inches long.

In A. G. Richmond's collection is a fine and slender bone awl from the Otstungo site, near Fort Plain. It is $7\frac{1}{4}$ inches long. A fine flattened and angular awl from Nichols pond is $4\frac{3}{8}$ inches long. Besides others, Dr Hinsdale found a long and nearly straight bone awl on the Sheldon site. It is 8 inches in length, and is angular. Another bone awl from the same site, having a double curve, is $5\frac{1}{2}$ inches long.

In the Richmond collection are the following three awls. A fine

and regularly tapering one is from England's woods in Montgomery county, where there is a recent site. This awl is 5⅝ inches long. Another of a straight and slender form is 7½ inches long, and came from the Cayadutta fort. A joint forms the base of this. A similar straight and tapering awl is from the same fort, and is 7⅝ inches long. This is worked throughout.

Mr Van Epps has many fine articles from the above site. Among these is a fine bone awl, 4¾ inches long, generally rather wide, but compressed toward the base. It is ridged on one side. Three long ones taper from a moderately broad base to a sharp point. One is 6 inches long, another is 7¾, and another 8 inches in length. Many other fine ones have been found on this early site.

Double-pointed awls occur in the mounds of Manitoba, and the leading forms and features are found throughout the world. In Canada there is a close correspondence with New York forms.

On Long Island Mr Tooker found the bones of the deer abundant in many shell heaps, but implements of this material were not frequent. Near the city of New York a few awls have been found. John B. James described one fine specimen from Van Cortlandt park, which was 5½ inches long and tapering in the usual way. In the shell heaps bones have been often found which had been split open to extract the marrow. Such examples occur elsewhere.

From the Atwell fort comes a large, straight and thick awl, polished all over, which is 8¼ inches in length. Another fine and straight awl is from Brewerton. It is 5¼ inches long, and has an expanded base. A very slender awl from the Christopher site is 4⅝ inches long, and has a point at each end. It becomes narrow toward one end, and then expands again. This article is quite unusual in form. Among other long awls may be mentioned one in the Buffalo academy of science which is 7 inches long.

At the mouth of Perch river, in Jefferson county, the writer dug up a fine polished bone awl, which was 7⅛ inches long, and nearly flat. It was not straight, but distinctly bent about a quarter of the way from the base. Another slender Jefferson county awl is 6½ inches long, and was found by Dr Amidon. Most of his best bone relics have been from two sites. This awl is angular, light colored, and thoroughly worked except at the base.

These examples will suffice to show how fine, abundant and widespread these implements are in the Iroquois territory, but it might be unwise to suppose they were less used elsewhere.

Fig. 5 is one of the broad and flat forms, which have a narrow and sharp point like an awl, but are otherwise suggestive of knives. They are not usually sharp enough for cutting flesh or hides, and a party of excavators jocosely called them paper knives. They might now answer for these. They may have been inserted in war clubs, but it is more probable they were used in flaying beasts. This fine example has a very angular outline, the broad surface suddenly contracting toward the slender and sharp point. It was found by Dr Hinsdale on the island at Brewerton. Fig. 26 is a flat and thin bone knife from the Atwell fort. The form is broad, the outline curved, and the base neatly rounded. There can be little doubt of its use. Two other fine examples have been described among the awls. Fig. 42 is one of the most pronounced forms. It is from the Christopher site, and is in the Bigelow collection. The general form is broad, the edges not quite parallel, and it is everywhere polished. On the reverse side it is broadly concave. One end abruptly narrows to a point, and the base slopes to a point on one edge. One surface is rounded, but it becomes thin and flat toward the point of the implement. This is one of the finest examples of this form yet found, and its use as a skinning implement can hardly be questioned.

Fig. 43 is another fine specimen, found by Dr Hinsdale on the island at Brewerton. It is flat and has nearly parallel edges. One of these is curved to make a sharp point, and there is a slight indentation near the rounded base. Fig. 58 is another, still finer and also more definite in character. It is in the Bigelow collection, and from the Christopher site. It has a double curve at the base, which is rounded. The edges are thick and mostly parallel, and it is worked on both sides. It is pointed, and the upper surface is moderately ridged. The outline is that of a broad knife, but there is no long cutting edge, and it may have been used in a war club, but more probably as a skinning implement. Fig. 60 is a fine article of the same kind, flat and with a longitudinal groove on one side, and somewhat rounded on the other. It has a broad point, and the base

may have been broken. This is from Brewerton. Fig. 61 is a fine, flat bone awl or narrow knife from the Cayadutta site. The point has been lost, and one edge ran straight to this. Most of the length the edges are parallel. The base shows a transverse cut close to the ornamental grooves, and it seems to have been broken there. The carving is of straight lines variously arranged. This is in the collection of Percy M. Van Epps of Glenville.

Fig. 62 is a flat and curved bone implement, one of the broad, rounded ends being sharpened. The edges are neatly rounded, and it is nearly a quarter of an inch thick. It was found by Dr Hinsdale on the island at Brewerton. Fig. 65 is fine and thick, and is polished all over. It is somewhat angular, and the reverse is concave. This is from Pompey and in the Bigelow cabinet. Fig. 66 is a broad, flat and curved bone knife, worked all over and ornamented with straight lines variously arranged. This was found near the village of St Lawrence, and belongs to Charles Crouse of Chaumont. These ornamented articles seem more frequent in Jefferson county than elsewhere.

Fig. 75 is unique. It is a thin and neatly worked knife, made from the antler of a young deer. It was found by George Slocum in the Onondaga valley some miles south of Syracuse.

Fig. 84 is a broken bone implement from the vicinity of the village of St Lawrence, and is decorated in the frequent style of that region. It suggests a long knife with parallel edges. These are rounded. The reverse is flat with a longitudinal groove. Fig. 88 was found by Dr Amidon near the same place. It is flattened and fine, with a longitudinal groove in one surface. These are usually part of the natural cavity.

Fig. 113 is a form frequent in Jefferson county. One collection has many and fine examples, but figures of these could not be procured. One similar to this, but larger, has four perforations, and some others have the same number. The one here represented is in the Bigelow collection and from the Christopher site, showing the probable migration of the early Onondagas from Jefferson county. It is highly polished all over, is nearly flat, and is pointed at both ends. The edges are rounded, and it has two perforations. Fig. 115 is from another early Onondaga fort, the Atwell site. It is flat, dark, and polished all over. One end is pointed and the

other rounded. The edges are rounded, and there is one perforation. Fig. 282 may be merely an awl, but is very broad. It is polished all over and is quite thick. The base is indented, and the edges are slightly convex. The frequent groove appears in one surface. This is from the Atwell fort.

Fig. 305 is the first in a series of three illustrating the formation of a bone knife, kindly furnished by Dr R. W. Amidon, and all from Jefferson county. This is a long medullary bone, split and chipped to a flat surface, the outside surface being left untouched. Fig. 306 is of a flatter bone, not only chipped on one side but brought to a knife form. Fig. 307 is worked into better shape, and is ready for the final grinding and polishing. This is whiter than the other two.

Fig. 114 is from Jefferson county, and made from a split bone. One end is pointed, and the base is nearly square. There is one large perforation near the edge, both edges being much curved.

A rude bone knife was found on the Seneca river, nearly opposite Three River Point. The general form is that of a case knife, resembling the bone knives the Onondagas made for sale nearly a century ago. The article is $3\frac{5}{8}$ inches long, but the blade is short. A flat bone implement of the knife form comes from the Christopher site. It is worked all over, has a large central perforation, and rounded edges, indented on one side toward the broad point. The length is 4 inches and the breadth $\frac{3}{4}$ of an inch.

Fig. 319 is a fine, broad knife made from the joint of a large, flat bone. It was found on the Onondaga outlet by Dr Hinsdale. It is highly polished on both sides; and for its length it is thin.

Punches and blunt implements

No precise use can be safely assigned to some articles with rounded or flattened ends. Those which are curved and slightly tapering were probably inserted in clubs. Others have purposely enlarged ends. If they had points, they might be considered pins, but usually these are lacking. It has been thought that some were used in decorating pottery, but a hollow bone seems the only bone article employed for this. In a general way it may be best to describe them simply as they are, unless there appear reasons for some special use.

Fig. 52 is an antler prong with a rounded point, found by Dr Hinsdale in Pompey, on the Sheldon site. It is safe to assume that this was used in a war club, as all of like character probably were. Many such forms will be left unnoticed.

Fig. 53 is usually termed a punch, without further suggestions of use. It gradually expands toward the larger end, which is neatly worked and almost flat. The smaller end is as neatly rounded, the general form being cylindric. This is from the recent site in Rice's woods, near Stone Arabia. Fig. 83 is a bone implement in the Waterbury collection at Brewerton. It suggests a small pestle, and is nearly square in section, having the edges and ends rounded. Fig. 87 is a Mohawk bone article in the Richmond collection, nicely worked and cylindric throughout. At one end the cylinder is abruptly enlarged, and both ends are neatly cut. Fig. 90 is a long and thick cylindric bone, which is unperforated. It is well worked, and the ends well rounded. It is in a Buffalo collection.

Fig. 91 is a very long cylindric bone punch, from the fort near Pompey Center. It expands slightly toward one end, and very much toward the other. Fig. 92 is a long, slender and cylindric bone implement, slightly curved. Near each end of the concave edge is a sharp notch. This is not perforated, and is one of four of various lengths, taken from a grave near Rochester Junction by C. F. Moseley of Bergen N. Y. The grave contained European articles. The other bone relics were shorter and thicker, evidently intended for beads but not perforated.

Fig. 96 is flat and thick, parallel sided, and with the ends nicely rounded. Dr Hinsdale found this at Brewerton, and with it two others, differing only in being shorter.

Fig. 97 may be a broken pin, having a thick and angular head. The general form is cylindric. It is in the Richmond collection, and came from Richmond Mills, Ontario co. Bone fishhooks were found with it. Fig. 99 is a cylindric bone, expanding into a broad, flat and curving edge. The small end is neatly rounded. It is from the recent site near Stone Arabia. Fig. 100 is a fine curved and cylindric bone pestle, found with a bone mortar at the Garoga or Ephratah fort, in Fulton county, by S. L. Frey. It is very neatly worked.

Fig. 103 is a short bone punch, cylindric, but expanding toward one end for nearly half its length. This is in the collection of F. H. Vail in Pompey Center, and comes from the fort, a little south of his house, known as the Lawrence fort. Fig. 112 is much like the last, but is longer, while the expansion is shorter. Some polished bone beads were with this, of the same diameter and average length. This is from the Atwell fort, and in the Bigelow collection. This form seems most common in the early historic period.

Fig. 131 is a cylindric and tubular horn implement, and may have been a charger for powder. The narrower projection at one end is an eight-sided stopper of horn. Found by Luke Fitch on a recent site north of Watervale in Pompey. Fig. 301 is a well worked cylindric bone, which is not perforated but may have been intended for a bead. It came from a grave at Rochester Junction. Fig. 297 is smaller than the last, but is of the same character and from the same place. The same may be said of fig. 298, which is much more slender than either. From their presence in a grave and nicely rounded ends, it may be inferred that they were finished articles, whatever their proposed use. Fig. 330 is a very neat cylindric punch, with the frequent neatly rounded ends, one of which is expanded. It is from Rice's woods near Stone Arabia. In the plate it is reduced in size, the true length being 3 inches.

Fig. 341 is a curious article from Brewerton, 9 inches long, but reduced in this plate. Dr Plato, the finder, thought it a tusk, but it is probably horn. For more than half the length from the rounded point it is cylindric; thence toward the base it is more quadrilateral, but with rounded edges. The base is abruptly and uniformly compressed, and has a long rectangular perforation. In Europe such holes were for holding stone points, but this does not seem the purpose here. The implement follows the natural curve of the material. Many curious things were found with this.

Fig. 346 is another curious article of deer horn, resembling the last in some respects but not closely. It is the lower part of an antler, retaining the base almost unchanged. All the prongs have been removed, and much of the surface dressed down. The tip has been cleft and sharpened where it was cut off, and toward the base is a rectangular hole, such as is found in the primitive bone whistle.

This and the last could hardly have been used as handles for stone points. It measures 7½ inches from tip to tip, and is nearly cylindric. This came from a grave at Jack Reef, on the Seneca river, and is in the Bigelow collection. A shorter prong was found with it.

A few other examples may be mentioned. One bone punch from the Atwell fort is almost elliptic in section. It is ⅜ of an inch wide and 2¾ inches long. From the same place comes a tapering but not pointed bone punch, which has the ends rounded, and is 2⅞ inches long.

In the Vail collection at Pompey Center is a cylindric and tapering horn punch, 5 inches long. Dr Hinsdale found a cylindric, slender and perforated bone at Brewerton, both ends of which were broken. It was 6¾ inches long, with an average diameter of a quarter of an inch. Another curious article is in the Waterbury collection. It is a slender, irregularly curved and pointed implement, 6⅜ inches long. There are transverse cuts near the pointed end, and rough and shallow grooves around most of the article. Dr Hinsdale also had, from the same place, a curved and cylindric bone, 4½ inches long. In W. L. Hildburgh's collection are many of the so called punches; and worked antler prongs occur on most village sites. One odd article in his collection is a curved piece of antler, 7½ inches long, which has notches toward the upper part of the convex edge. This came from Pompey.

Beads and pendants

Fig. 35 shows one of the birdlike pendants, which are perforated laterally through the neck. This is ornamented with dots and lines, and comes from Scipioville. They are more frequent in shell than in bone. Fig. 36 is another from Honeoye Falls, belonging to C. F. Moseley of Bergen. There are transverse lines on this, and the eyes are represented. Fig. 129 is from Pompey, and is ornamented with dots. All are of the historic period, late in the 16th and early in the 17th century.

Fig. 95 is a moderately long cylindric bone bead, highly polished, and well worked at both ends. This was taken out of ashes at the Atwell fort in 1896 by Rev. W. M. Beauchamp. It is a fine example of its class. On sites of that age bone beads share the

honors with those of shell, while others but a few years earlier may show only bone beads and ornaments.

Fig. 124 is a long, straight and cylindric bone bead, found in Pompey. It is polished and slender, and has transverse diagonal lines. Fig. 132 is from the same place, its outline being a long ellipse. It retains its polish. Fig. 136 is a large and cylindric bone bead from Pompey. It is a little curved, and the ends are well finished. Fig. 137 is a straight and polished cylindric bone bead from the same town. It is adorned with cross grooves. Fig. 138 is another cylindric and curved bead in the Waterbury collection at Brewerton. Long beads usually retain the curve of the bone, and the perforation may be unaltered or enlarged. Fig. 174 is a short, flattened cylindric bead found near the mouth of Perch river.

Fig. 139 is of a different character, and is from the fort near Jamesville, burned in 1696. It presents a rectangular outline here, but is triangular in section, and was made with metallic tools. It is in the Bigelow collection. Fig. 140 is a curious little ornament or implement from the Atwell fort, unperforated, though a slight depression may indicate a hole begun. It is foot shaped and indented, and is now in the Burr collection. Perforated articles, similar in form and size, have been used to keep open the slits in noses and ears. One like the figure here given was found in a mound on the Bay of Quinté, on the north shore of Lake Ontario.

Fig. 144 shows the end of a femur bone, worked and perforated for suspension as an ornament. This was found by Dr Hinsdale on the Sheldon site in Pompey. The outline is more elaborate and the perforation larger than in several examples from another Pompey site, a few miles away, and perhaps of 50 years' earlier date. Fig. 356 to 361 are all from the Christopher site, and in the Bigelow collection. Fig. 357 is a good example of the same ornament. It is partly smoothed on the reverse, and has a small perforation, like all others from this site. Fig. 358 has been ground smooth on the reverse. Fig. 359 is perforated through the natural depression, and smoothing has been begun on the other surface. Fig. 360 is made from the concave capping of a joint. The natural surface is here shown, slightly worked. On the reverse it is ground smooth.

The perforation is central. Fig. 361 shows the rough side of a similar plate, showing signs of use. The figure presents the convex surface. All these are of a deep brown color, which may have come from exposure or choice.

Fig. 356 is a broken but well wrought ornament, hard and white as ivory, and with a high polish. It is a carving of a bird's head, with a perforation for the eye. The lower edge is sharp, and ground from both sides. It is concave on the reverse.

Fig. 145 is a short and cylindric bone bead from Buffalo. Fig. 146 is longer and more slender, and was found in Cayuga county. It has transverse grooves and is recent. Fig. 147 is a black bone bead, discolored by lying in the water. It was found by Dr. Hinsdale at the mouth of Chittenango creek, and is short, curved and cylindric. Fig. 158 is a short bead in the Richmond collection, from the Nichols pond site. Fig. 165 is a long and cylindric bead from Rice's woods, and is in the same collection. It has three groups of encircling grooves. Fig. 167 is a so called crescent from Venice, Cayuga co. These are usually of shell. In stringing they were placed close together, or separated by short beads. Fig. 276 is unique, and is in the Richmond collection. It comes from England's woods, where the caches are found northeast of Stone Arabia. It resembles the common bird forms except in its large size, and in having feet near the tail. Fig. 300 is an ovate bone ornament in the Buffalo academy of science, probably intended for perforation and suspension.

Fig. 347 is a flattened ornament, perforated from top to bottom, which would be triangular but for being cut off above. Fig. 348 is similar, but is almost pointed. In section each is a flattened ellipse. Several of these were found varying much in outline and size, but having the same general character. They were obtained 2½ miles north of Fort Plain.

Perforated and grooved teeth

Teeth and claws have been a favorite savage decoration all over the world, and the perforated bears tooth of Europe scarcely differs in appearance from that of America. There are probably very few village sites in New York where this is not found, cut, perforated or with a groove around the base. On camp sites of brief occupa-

tion these teeth can hardly be expected. The teeth of smaller animals were in less favor, though sometimes used. Human trophies perhaps had not the esteem which some have supposed. Fingers were cut or bitten off by the fierce Iroquois, but there is positive evidence that these were not preserved, as some have thought. Accustomed as they were to plucking out the nails of captives, it is not likely these were kept as trophies, as has been reported. The French often told such things, as the enemies of the Iroquois related them, and De Vries said that either the Mahikans or the Mohawks "place their foe against a tree or stake, and first tear all the nails from his fingers and run them on a string, which they wear the same as we do gold chains. It is considered to the honor of any chief who has vanquished or overcome his enemies if he bite off or cut off some of their members, as whole fingers." *De Vries*, 3:91. This, he was told, was done at Albany, which was in the Mahikan territory.

Father Jogues mentions the Mohawk practice:

There remained to me only two nails; these barbarians tore these out with the teeth, lacerating the flesh beneath, and stripping it even to the bone with their nails, which they nurse until very long. *Relations, 1647*

In the *Relation* of 1658 it is noted that the savages "nourish their nails as a mark of nobility, showing that their hands are not fit for work." A necklace of this kind might thus show the rank of those tortured or slain. Most narratives give the impression that they were torn out and cast away. In the nature of things they would not have survived to our day, if preserved then.

In a paper entitled "Medicine men of the Apache," Capt. John G. Bourke describes the use of perforated human teeth as ornamental trophies, in many parts of the world. He says, "In my own experience I have never come across any specimens, and my belief is that among the Indians south of the isthmus such things are to be found almost exclusively. I have found no reference to such ornamentation or 'medicine' among the tribes of North America." *Bourke*, p. 487

Human teeth occur on Iroquois sites unconnected with graves, for in their cannibal feasts these might be dropped anywhere, but perforated teeth are certainly rare. Fig. 162 is one from an Oneida

site near Munnsville N. Y., now in the writer's possession and attached to a string of small disk beads. It is perforated laterally at the base, and is in good preservation. In graves the teeth are usually the best preserved parts of the human frame.

Fig. 195 is another rare specimen from the Onondaga fort of 1696. It is the crown of a tooth neatly cut off and perforated for suspension, the hole being at one corner. The grinding surface is much worn, but it appears to be one of the lower side teeth of the black bear. This is in the Bigelow collection. Fig. 188 is a perforated tooth from Pompey, owned by Mr Fitch. A similar one was with it, and it is one of the front teeth of the woodchuck. Fig. 293 is much like the last, but has been cut down to a greater extent. It was found at Munnsville.

Fig. 178 is part of a beaver's tooth, split and then ground flat on the inside. It was found by Dr Hinsdale at Brewerton. Fig. 179 is another woodchuck tooth from the Christopher site, which is notched like a saw. Such examples are rare. Fig. 296 is another perforated and worked tooth of the beaver, found at Brewerton. It is of a red color and quite large.

Fig. 193 is an elk's tooth, perforated and ground off at the base. It is in the Richmond collection. It was found on the Otstungo site. Fig. 194 is another from Brewerton. The only work on this is the perforation. Several found there were perforated and more or less ground. Fig. 272 is from the Onondaga fort of 1696, and is in the Bigelow collection. Another elk's tooth with it was cut off at one end. Fig. 273 is a smaller tooth in the Burr collection, found on the Atwell site. It is quite dark in color, and one with it was opalescent. Fig. 274 is a smaller perforated tooth from a prehistoric fort a mile west of Baldwinsville and north of the Seneca river. It is in the Bigelow collection. Elks teeth were and are highly prized by the Indians, and now bring a high price. A few more will be mentioned later.

Fig. 294 has the appearance of a wolf's tooth, and is in the Buffalo collection, where there is another. Fig. 292 is similar and from Geneva.

Bears' teeth unworked are frequent; and out of a great number of those used for ornament a few selections are here made. They

occur on almost all village sites, and have a wider distribution than any other bone ornament in time and territory. Here there are three principal divisions: those grooved for suspension, those perforated, and those cut off for some other purpose. Fig. 286 is the common form of those perforated, the work being confined to the perforation as a rule. This is in the Vail collection at Pompey Center, and was found in 1894. Many of these have been figured. Fig. 316 is of a very large size, and was found by Oren Pomeroy in the vicinity of Chaumont bay. As it was evidently broken before being worked, it was probably the cherished trophy of some big bear fight. The base is indented and the perforation large. It is carefully worked all over, and every fracture is neatly smoothed off.

Those grooved for suspension show more variety, and yet require but little illustration. Fig. 283 is a tooth both grooved and much cut down. It has been split since it was formed, and is in the Vail collection. Fig. 288 is simply grooved, and is from Rice's woods in Montgomery county. They seem most abundant on recent sites.

Fig. 287 introduces us to a very interesting class of bears teeth. It was found by Dr Hinsdale on the Christopher site, and is merely cut off at the base, presenting a flat surface there. This site was probably occupied in the 16th century. Fig. 289 is unique, having a piece neatly cut out of the point, leaving it very sharp. This was found in 1899, on the north side of the river at Brewerton, and is in the Waterbury collection. Much of the surface has been ground and polished.

Passing from these, we come to the distinct class mentioned, where the base is sharply cut away nearly or quite half way to the point, exposing the cavity of the tooth. Fig. 143 is a good example, and was found by Dr Hinsdale at Brewerton, in or close to the grave where the walrus tusk implement was obtained. It was probably of a later date than that. Four large teeth and one smaller were worked alike. Fig. 290 is another of these. Fig. 291 is from the early fort west of Baldwinsville and north of the river, probably occupied in the 16th century. It is in the Bigelow collection, and is cut off in a different way. While this form is rare, it has been found on an early site in Ohio.

A few perforated or grooved teeth may be mentioned. A bear's tooth with a groove comes from the Atwell fort, and another with a narrow groove from lot 27, Pompey. One perforated at both ends is from Jefferson county, and thence comes another with the base rounded and the tip ground sharp. Another perforated example is from the neighborhood of Waterburg in Tompkins county. A large one is from Rice's woods. Mr Bigelow has a fine one from the fort of 1696, and a perforated deer's tooth from a fort near Baldwinsville. Raymond Dann has many from a site near Honeoye Falls. A perforated elk's tooth is from Munnsville, and another is in the Vail collection.

In the Hildburgh cabinet are good examples of all the forms mentioned. One is a good specimen of those of the bear cut off near the center, and is from a recent site a mile north of Lima N. Y. This would bring them into the historic period, but most seem a little earlier. Three fine and grooved bears teeth are from a recent site at Oneida Valley, and several perforated ones are from West Bloomfield. With these were perforated elks teeth.

Ornamental forms of bone

Unless some of the articles called awls were used for decorative purposes, bone and horn were but little employed in adorning the person. A few things have an ornamental character, but they are so few that they will not detain us long, as beads and pendants have already had attention and bone combs will be treated separately.

Fig. 105 is a fragment found by Dr Hinsdale on the Christopher site. The broader part is ornamented with long rectangles engraved in the bone, and the narrower portion with notches in the edges. It may have been a comb, but more probably was the handle of some implement. Fig. 106 is unique, and seems the upper part of a pin or awl. It ends with the head of a fish bent a little out of the plane of the handle, and below this is a broad band encircling the handle. It was found by the writer on the fort site before mentioned as west of Baldwinsville.

Fig. 150 belongs to Col. W. B. Camp of Sacketts Harbor, and was found on a point east of that place. There are four human heads at the top, and there is a deep cut at the base as though for the insertion of some instrument. The general character is that of

recent work. Fig. 151 is a curiously carved article from the Nichols pond fort. It is hollow and flat, being but $\frac{5}{8}$ of an inch thick. The two hollows within are not connected. On the reverse and toward the point are three parallel elliptic openings into one cavity. By these it might have been attached to the apparel, or a blade might have been inserted in the broad opening at the other end. The reverse is quite flat. As this fort is identified with Champlain's expedition of 1615, there is a definite age for this carved bone. In some respects it resembles Eskimo bone handles, and probably was made with metallic tools.

Fig. 155 is from the Otstungo site and in the Frey collection, and may be compared with fig. 151. It has an owl face and elliptic openings on each side, and was probably a handle. Fig. 154 is also in the Frey collection, and is from a figure made by him. His description is brief: "A piece of antler decorated; cutting evidently done with a flint knife. Found at Garoga, August 1889, by S. L. Frey." The edges of the terminal opening are scalloped, and the straight grooves are variously arranged. The elliptic grooves are a novelty at so early a date, and with the tools probably used. It may have been a handle, but the ultimate design may have been a pipe. It is certainly fine.

Fig. 153 is one of three articles found at Union Springs, and is the smallest of the lot. The points of all are cut off. The longest is 4 inches in length, an inch broad at the top and partly scalloped there. Another is $3\frac{1}{2}$ inches long, as wide as the last and with marginal dots. All are of thin horn, cylindric and hollow. This one is abruptly compressed toward the point, and has short marginal cuts at the broad end. The general form of all approaches a cone. In John Murdoch's *Ethnological results of the Point Barrow expedition*, p. 189 and 301, are some figures resembling these, but with well defined teeth of some length. They were called combs for deerskins. These could not have been used in that way, and more probably may have held charges of powder.

Fig. 157 is the broken, ornamented head of a pin or awl found on a fort site west of Baldwinsville, and now held by the writer. The reverse is a little differently carved. Fig. 310 is a broken article, apparently made from a moose antler. The form

may have been obtusely elliptic with broad notches or points at the ends. Dr Amidon found this in a refuse pit near St Lawrence village, and thus described it:

Part of a gorget, or some other article of adornment, made from — I should say — moose or caribou antler, because of its great breadth and flatness. Probably double-ended, i. e. symmetrical. Found only one end. On the back are two holes for suspension by a thong. The front is traversed by transverse lines, between which are decorations of a cuneiform character.

The two holes may have terminated in the interior cavity, as they converge, but may possibly have passed through to the frontal surface. It probably lacks but little of the original length and breadth, judging from the surface curves. The arrowheaded marks are peculiar, and in four rows. Another might have been expected, but there are no signs of this. The interior is now cellular, without signs of work. The general style is somewhat recent.

One class of grim ornaments has left some examples. The New England Indians were at first credited with taking the heads or hands of their enemies as trophies. The Neutrals of Canada gloried in the number of human heads they had taken. This may be understood literally or may refer to the scalps which they removed from the heads. However this may be, ornaments made from human skulls are sometimes found in New York. Fig. 141 is one of the best examples now known, and was in the Twining collection. It came from Rutland in Jefferson county, is nicely worked around the edges, and has nine perforations. Fig. 148 is a fragment found in Pompey. There are two perforations remaining, and part of a third. It is flat and thin. Fig. 149 is a perforated pendant of bone from Hemlock lake, Livingston co. N. Y. A photograph of this was furnished by Dr T. B. Stewart of Lock Haven Pa. The bone is much curved, and the figure suggests part of a skull.

Fig. 201 is also of a doubtful nature. It is a small oboval bone gorget, with one large and two small holes, and is slightly concave. It is a recent article from East Bloomfield, owned by Irving W. Coats. Fig. 202 is in the Vail collection, and comes from the recent fort near Pompey Center. It is a grooved, cut and perforated piece of human skull. A grooved fragment was found with this. Fig. 303 is a thick, flat and curved bone. The writer does not

remember whether it is a piece of a skull, as is probable. There is one very large perforation, and part of another intersected by one worked edge, showing that it was at first a larger ornament, which was broken and recut. The two worked edges are curved. This is black and light brown in color, and from the Atwell fort.

Fig. 333 is part of a perforated skull found by Dr Amidon in Jefferson county. It was evidently much larger, but a small part of the original curved and polished margin now remaining. There are now two holes, the one farthest from the curved margin probably being near the original center. In the plate the fragment is much reduced, the full length being $2\frac{3}{4}$ inches. Dr Getman has similar articles, one having an ornamented edge and several perforations.

Mr Twining reported some articles from the old Tamblin farm, in the town of Rutland, Jefferson co. and among these "an amulet, some 5 inches in diameter, drilled with seven holes, and cut from a human skull. The holes were undoubtedly made on the head of a living subject, judging from the appearance of the openings." He furnished the sketch for fig. 141, also from Rutland, but that is smaller and has more perforations. At another place in that county he found "two circular amulets with holes therein, from human skulls."

In the Brewerton cemetery Dr Hinsdale obtained a flat piece of bone, sawed so as to have six edges. The extreme length was $2\frac{3}{4}$ inches. In this was a large circular perforation, $\frac{3}{4}$ of an inch across. The ultimate design can only be surmised.

A very curious long skull was found in Cayuga county a few years ago, which was circularly perforated in an upper angle of the forehead, but not by drilling. The proportions were very remarkable, being 8 by $4\frac{1}{2}$ inches, and caused by pressure. The interior ends were rather smooth, and the sides strongly corrugated.

Among human bones may be mentioned a much flattened tibia, found in the grave with the walrus tusk implements at Brewerton by Dr Hinsdale. It is $8\frac{3}{8}$ inches long, $1\frac{1}{4}$ inches wide in the center and $\frac{11}{16}$ of an inch thick, which is a moderate form of platycnemism. Most of the bones in this grave were decayed. Fig. 336 is another human bone from the same place, which is worked at one end and the natural groove deepened. This is reduced.

J. S. Twining furnished the writer with several outlines of carved bone articles from Jefferson county, but the details were too few for reproduction here. Henry Woodworth, of East Watertown, has worked and perforated pieces of human skulls in his fine collection, and many of his bone articles have ornamental lines. Unfortunately he would allow no drawings to be made.

Fig. 111 appears to be a bone pendant, and was found near Munnsville. Provision for suspension has been made, and the point has been cleft. Fig. 85 is an open and ornamented bone, pointed like an awl, but possibly an ornament for the ear or nose. It comes from Buffalo.

Fig. 63 and 64 represent a type of bone articles from some parts of Jefferson county, which has been reported nowhere else. They are of various sizes, like a canoe paddle in outline, and with a knob at the top. Sometimes they are ornamented with engraved lines. The writer has seen them only in the Twining and Woodworth collections, and they seem purely local. Since writing this he has examined a fine one found in the summer of 1901 by Mr Pomeroy, at Storrs Harbor, Jefferson co. It is flat and thin, and 5 inches long. At the same place Mr Pomeroy got a fine clay pipe bowl, with a human face before and behind.

Fig. 130 may have been intended for an ornament, possibly a pendant. It is perforated for suspension, and compressed at that end, but was probably used for receiving charges of powder. It is recent of course, and was found in Fleming. The material is horn, and is quite thin.

Fig. 56 may properly be called a bone pin, having a thin and flat head, and a point which is moderately sharp for so thick an article. The diameter is but half as much the other way. Bone pins with distinct heads are very rare, though one example may have been already noticed. Dr Hinsdale found the one here described at Brewerton.

Fig. 278 is reduced from Schoolcraft's great work on the North American Indians, and shows a long and slender pin of polished bone, found in 1835, in excavating at Fort Niagara N. Y. It is 10½ inches long, ⅛ of an inch thick, and is somewhat curved. The head is bifurcated, and has two short hooks on each side. He

called it an awl, for which it is unnecessarily long and slender, and there can be little doubt that this fragile and well preserved article was an ornamental pin.

Bone images and masks

Artistic results in bone carving could hardly be expected before the Indians had metallic tools. So, when a well worked face or head appears, it is natural to infer the use of these, even on what seem prehistoric sites. Fig. 177 is a finely made bone face, with a narrow and rudely worked projection beneath. On each side are half circular notches where the ears should be, and there is a partly drilled hole in the back. This is interesting from its age, being from the early Cayadutta site, where but one recent metallic object has been reported. It is probably not far from 300 years old, and is in the Richmond collection. The work suggests the use of metallic tools.

Fig. 156 is in S. L. Frey's fine local collection, and came from the Otstungo fort, always classed as prehistoric by working antiquarians, though Mr Squier was told that European articles had been found there. It is a well carved bone head, and the helmet-like headdress and possible moustache suggest some knowledge of Europeans. Some other articles from this site hint at the same thing. If made with stone tools, it is certainly very remarkable.

Fig. 152 is a well wrought bone head from the Onondaga fort of 1696, and was probably made with European tools. It is in the Bigelow collection, and was worn as a bead, there being a single large perforation from top to bottom. Usually there are more perforations in such objects, to insure the face's turning outward. For this purpose there are three small holes for suspension in fig. 175, which is in the Hildburgh collection. It is a small and neat bone mask, with a projection above and below. This is from a recent site at West Bloomfield, and is much like some stone ornaments of about the same age.

The remaining figures of this class are full length bone images. Fig. 169 is from Honeoye Falls, and is in the Dann collection. It is a large, flat human image of bone or horn, unpolished and unbroken. It has much the character of the bone combs so frequent there, but seems complete in itself. Fig. 170 is a bone image of a

small child, smoothly carved. It is from the Mohawk valley, and in the Richmond collection.

Fig. 171–73 are from drawings of three bone images in the state museum, made by R. A. Grider, and much like Canadian examples. All come from West Bloomfield, and are light brown in color. Fig. 176 is the largest bone image yet found here. It was found in a grave of an adult and a child, which contained bone beads and some copper wire, and belongs to S. W. Morse of Willow Point N. Y. The back is much weathered, and there are longitudinal cracks. There is a prominent headdress, probably representing the symbolic horns of an Indian chief.

A finely carved head, terminating a piece of deer horn, comes from an Indian site at East Aurora. It is of very recent character. In the deep ashes of a fireplace in the Genesee valley, a beautifully carved Chinese head of ivory was found, which must have come there in the way of Indian trade. Prof. G. H. Perkins of Burlington Vt. has a fine bone mask from the northern Vermont line, closely resembling some small stone masks of New York. All such articles are of recent date.

Bone combs

The Indian use of bone combs seems not very old, and yet is prehistoric in a sense. Most of those found are of the 17th century, but some seem a few years earlier, suggesting a knowledge of Europeans without direct contact. The early ones are very simple in design, and with few but strong and large teeth. They are almost entirely confined to Iroquois sites, or those classed with them. Out of a large number a few forms are given here of both periods. All those in Jefferson county, and a very few elsewhere, may be called prehistoric.

Fig. 186 is one of these early forms from Jefferson county. It has scalloped edges and some elliptic perforations, and the four large teeth are all broken. Fig. 187 is from a drawing furnished by Mr Frey. The type is early, though from a recent Mohawk grave. There are but four teeth, and the upper part of the comb is highly ornamented. The article is perfect and fine. Fig. 196 is from an early Onondaga fort of the historic period, on lot 100, Pompey. Three teeth remain, but another seems to have been

broken off while in use, as the fracture has been ground down, leaving only the notch. There is a large perforation near the top, opposite which is a sharp notch on either side. There is no distinct ornamentation. Fig. 198 is a fine broken comb from Hemlock lake, Livingston co. N. Y., and belongs to Dr Stewart of Lock Haven Pa. One of the large and long teeth has been broken off. In the small upper part there is a large circular central perforation. Fig. 199 is from the Atwell fort. This also has three teeth, and there is an elliptic perforation near the top, with grooved lines. Fig. 200 is from the same site and in the Burr collection. There are four teeth and 11 perforations. Both these are of the simple early forms. There are good examples of these in the Woodworth collection. Fragments of some plain combs have been found at the Lawrence fort near Pompey Center. In the Richmond collection are some rude perforated and unperforated plain combs, but their width and the number of teeth at once show their recent date.

A plain, broken and double comb has been ascribed to the Atwell fort. The location is probably erroneous, as it has many teeth, and its general character is too recent for that place. It certainly was made with metallic tools. In the state collection is a large bone comb from Genesee county, which has three teeth and is 8⅛ inches long. It has a human figure in the upper part, but the general type is early. There are lines and openings about this figure, and above and along one margin are small circular perforations.

The figures which follow are of the historic period, and are mostly symmetric. Fig. 180 has two men facing each other in combat, and is perfect. It is broadest at the top, where the corners are neatly rounded. This is from Scipioville, Cayuga co. The Cayuga specimens were found by W. W. Adams, but have gone into several collections. Another of these has two serpents in a similar position.

Fig. 181 is unsymmetric, and the teeth are mostly gone. It is from Honeoye Falls and in the Dann collection. A bird faces a man, and is of about the same hight. The bird's bill was probably joined to the man's shoulder. Fig. 182 is also unsymmetric, and was found at Rice's woods. It has a lizard above, the long tail

hanging down one side. Below this are lines in various directions. But two of the teeth are broken. They are many and short.

Fig. 183 is from a grave at Rochester Junction, and belongs to C. F. Moseley of Bergen N. Y. It is perfect, and two birds form the upper part, their long bills meeting. Fig. 184 is a fine comb from the McClure site in Hopewell N. Y. Most of the teeth are broken, but the upper part is entire. This has a perforation in one upper corner, and there are several figures scratched on the smooth and broad surface. It may have been unfinished. It was found in 1890. Fig. 185 is unsymmetric and large. A man behind a horse, and one on it form the principal design. This was found in a young woman's grave in one of the Seneca villages burned in 1687, at Boughton hill near Victor N. Y., by Dr A. L. Benedict of Buffalo. The teeth spread, and nearly half are gone. The skeleton in this grave was of a person about 18 years old, and was buried in a reversed position, the head down and feet above. In the graves were a brass kettle, traces of a basket, about 12 feet of French glass beads of several colors, 20 feet of red glass beads, about 35 feet of council wampum arranged for a belt of five or six rows, and seven long shell beads. Besides the comb, there was also the skeleton of a turtle.

Fig. 189 shows a bear at the top of a large comb, and is in the Dann collection. The teeth are badly broken. Fig. 190 is a recent, fine Mohawk comb in the Richmond collection. There is a large arched opening above, and this and the outer edges are notched. Fig. 191 is a long, rectangular and flat bone in the same collection. It has a circular perforation at one end, and regular notches at the other. Mr Richmond thought this a pottery marker, but pottery has no even and regular lines, and it was probably begun for a comb.

Fig. 192 is a fine comb with about half the teeth remaining. Two turkeys, separated by a central post, have a circular ornament above their heads. This is from Fleming, Cayuga co. Fig. 197 is of a similar character and from the same place. Two partridges are fighting. Usually the space below is plain; in this case lines are regularly arranged in various directions. Fig. 337 is the longest comb which has met the writer's eye. It is slightly broken in

places, but the defects are not serious. Two quadrupeds — probably wolves — are rampant, and their upturned mouths hold a serpent's head. The short, plain space beneath them has a horizontal line of circular perforations, and the teeth are nearly perfect. This very fine comb is from Honeoye Falls, and in the Hildburgh collection. The length is $10\frac{1}{4}$ inches, and the teeth are $1\frac{3}{4}$ inches long. It is much reduced in the plate. The owner kindly furnished blue prints of his relics. In Mr Hildburgh's collection are three other good examples, all somewhat broken, and all from the same site as the last. One has a man standing behind and probably laying hold of a rampant animal whose head is gone. One has two bears rampant, and in this only the teeth of the comb are missing. Another has an animal standing with the head turned back over the shoulder. The teeth and tail of this are broken.

A few others may be mentioned. The writer found a broken one at the recent site overlooking Wagners hollow in Montgomery county. It had teeth at both ends and two perforations. This was in 1889. On the same spot he found a thin, flat bone, nearly square and well dressed, the front and edges being smooth. It was $2\frac{1}{2}$ by 2 inches. Slight cuttings had been made at one end, preparatory to forming a comb. On the same spot were copper saws used in this work. A straight piece of sheet copper was selected, and fine teeth were cut in this with a file, making a serviceable implement.

In the Richmond collection is an unfinished comb from Rice's woods, which has a central perforation, short teeth at the broad end, and three notches at the narrow.

In the Dann collection are a number of combs, and among them is an unfinished one of much interest. The teeth have been finished and afterward broken, and the full outline has been formed. There are two excavations and some lines. The unfinished design seems to have been that of two turkeys with raised heads. It is interesting as showing that these were actually made in Iroquois villages of the last half of the 17th century. Two of these have quadrupeds rampant, two on each comb. Another has two birds, and still another two bears in the same position. One has a human bust, and all are more or less broken.

It is curious that, while so many have come from the old villages

of the other four nations, not a single specimen has the writer seen from an Oneida village, and but one broken specimen from the Oneida territory, which is double as regards teeth. They must have been used by the Oneidas with the other Iroquois, and probably some have been found. It suggests the danger of rash conclusions from negative testimony. What has not been reported or found, may have existed and been used.

Pipes

It is barely possible, but hardly probable, that pipes of bone and horn may sometimes have been used in prehistoric times. These materials are combustible in a limited degree, and the burning tobacco would certainly have had a new flavor in a bone pipe, while the latter would soon have lost form and substance. This difficulty was obviated, at a later day, by lining the bowl with a thin sheet of metal. The question then arises whether any early article in the form of a pipe bowl did not have some other use. But for this action of the burning tobacco on the bone, there would be no hesitation in calling fig. 204 the bowl of a pipe. It is hollow within, and has a lateral perforation near the base, just as in pipes of which there is no question. For these reasons it is temporarily placed here, though its proper position may be with the bone whistles, which it resembles in form. It is four-sided, nicely worked, and has a human face scratched on one side. In fig. 203 the lateral perforation is near the broad end, and the larger cavity goes through the bone. No one will hesitate to call this a whistle or tube, though so near the last in appearance. The one before described is from the Atwell fort; this is from the Christopher site.

It has been suggested that fig. 154 may have been designed for a pipe but not completed, and this would be the writer's opinion but for this manifest difficulty in early use. In the state museum, however, is a bone pipe procured by Mrs H. M. Converse in Canada. The Indians there considered it an antique, but it clearly is a modern form. The metallic lining has disappeared, and it seems to have been used after this. The spiral grooves which held the metal in place still appear. On the top of the stem are nine crosses which were made by one hand, and are not mnemonic. It is a rare article, however, even in a modern form.

Fig. 159 is a very fine example of a pipe made from a large antler, which belongs to the writer, and which is probably a little over a century old. It retains the metallic lining in the bowl, without which no pipe of this material could be used. Its history is a little obscure, but it belonged to an early Onondaga pioneer, and was probably made by an Indian of that county. All the prongs but the basal have been cut off, and the bowl is in the cavity between that and the main branch. The carved lines have been filled with red or blue paint, and the holes and some other parts are edged with red. There are numerous perforations, as may be seen. The antler was split from the tip down to the bowl, and the unpolished side painted with Indian red. The stem is made of some light wood, with five encircling bosses, inserted in the stem hole at one end, and tied with buckskin near the other. This is about 14½ inches long, the figure being one half the actual dimensions each way. The chord of the arc of the antler as it is, is 11½ inches. The antler was an extremely large one of the Virginia deer. It is a very fine article, and probably absolutely unique.

For the reasons given, bone and horn pipes are among the rarest of Indian articles. That they might have been used 250 years ago is not impossible, but probably all made 150 years ago could be counted on one's fingers. There is probably not one existing for which a date so early can be verified. In speaking of one in the Toronto collection, Mr Boyle said: "Pendants and even pipes were made from bone. The last class of bone objects, it should be said, is very seldom seen. Only one has come into our possession so far, and it may have been a makeshift." *Boyle*, p. 76. This is a hollow bone, about 2¼ inches long, with a central perforation in the side.

Chisels and gouges

Fig. 13 is a small bone chisel, the locality of which is not certain. It probably came from the Atwell or the Nichols pond site. It is sharpened at the broad end and was in the Ledyard collection. Fig. 94 is a bone chisel from the Mohawk valley, and is in the Richmond collection. It is thick and broad, and is sharpened at both ends. Fig. 93 is like a chisel in general form, but the ends

are not sharp. It is well worked and nearly square in section. This is in the Waterbury collection at Brewerton.

Fig. 340 is a long bone gouge from the Atwell fort. A little of the top and most of the base are gone, but it is still $7\frac{3}{4}$ inches long, being much reduced in the plate. There was probably a point at the top, as well as a cutting edge at the broad end. Fig. 86 is a long and curved bone implement, naturally grooved, but having a perforation at the flat end. It is but slightly worked, but may have been intended for a gouge. It was found by Dr Hinsdale at Brewerton. Fig. 267 was also found by him at the same place, one piece being obtained by him in 1897, and the other the following year. It is made from a walrus tusk, and another implement was found of the same material, which also occurs north of Lake Ontario and the St Lawrence. The gouge is rather rude.

A figure should have been given of a broad bone gouge found by Mr Frey in the graves at Palatine Bridge, and figured and described by him. It is $4\frac{1}{4}$ inches long and 2 inches broad, and is unusually fine.

Arrowheads

It is the custom to call hollow bone or horn points arrowheads, and they would have served this purpose very well by fitting the shaft into the cavity. Such articles are widely distributed, but nowhere abundant, and could have been used in this way only in exceptional cases. This may be qualified by saying that, if lost in the woods, they would not be preserved, and, however plentiful they might once have been, they would not endure like those of stone. The probability is however that as well finished articles they were little used.

This is not the only form of bone or horn arrowhead. Occasionally we find those made for insertion in the shaft, but these are much rarer than the form just mentioned. Very few have been found. Early writers on America testify to the frequent use of bone, and it is very likely that some things, naturally sharp, were used with little preparation. A merely splintered bone at close range would be very effective. A better point would be needed for a long shot.

In the *General historie of Virginia*, by Capt. John Smith, it is

said, "Their hookes are either a bone, grated as they noch their arrowes, in the forme of a crooked pinne or fish-hooke, or of the splinter of a bone tyed to the clift of a little sticke, and with the end of the line they tie on the bait. They vse also long arrowes tyed in a line, wherewith they shoote at fish in the rivers. But they of Accawmack vse staues like vnto Iauelins headed with bone. With these they dart fish swimming in the water." *Smith*, p. 31

Here we are to understand that the long arrow, used in fishing, had a line attached to prevent its loss, while some Indians used a longer and stronger handle, requiring no such precaution.

At a later day John Josselyn said much the same in his *Account of two voyages to New England.* Some fish the Indians took in the harbors, "striking them with a fisgig, a kind of dart or staff, to the lower end whereof they fasten a sharp jagged bone (since they make them of Iron) with a string fast to it, as soon as the fish is struck they pull away the staff, leaving the bony head in the fishes body, and fastening the other end of the string to the *Canow*." *Josselyn*, p. 140

The account suggests the barbed and perforated Iroquois harpoon.

Before considering the many types of the barbed bone harpoon, a few examples may be given of the simpler arrowhead.

Fig. 12 is a good example of the hollow bone point, found by Dr Getman at Perch river in 1899. This is nicely ground and sharp. Fig. 14 is a much larger size, and is of partly polished horn. Like the last, it is nearly cylindric. It was found by Dr Hinsdale at Brewerton. Fig. 22 has been noticed, but some consider this type as arrow points. This is not the writer's opinion.

Fig. 77 is a rare form from the McClure site, Hopewell. It is a triangular bone arrow, with indented base and broken point. The compression of the base serves a double purpose, to sharpen the barbs and affix the shaft. Fig. 78 is from Oneida Valley, and is in the Hildburgh collection. It is thickest in the center, and is not a frequent form. Fig. 79 may be provisionally placed in this general class, since it is hollow and pointed, but the large perforations add new features. These are not opposite, nor is the base cut straight across as in the arrowheads. Its size is another thing, and it may

have been intended for a dagger or spear. It is from the Minden or Otstungo fort and is of horn. Fig. 108 is another fine example, smaller, but having much the same character. The base is neatly cut across, but is now gougelike on one side. The implement is of hollow horn, quite sharp, and perforated from side to side. It is not highly polished, and the natural grooves remain at the base. This was found at Brewerton by Dr Hinsdale.

Fig. 304 is a broken and triangular arrow, much like those of flint. It is perforated in the center, has an indented base, and is irregularly worked. Of course it is not hollow. This is from the Atwell fort, and in the Burr collection. Fig. 311 is a horn arrow point, hollow and chipped, and with an indented base. It is in Dr Amidon's collection. Fig. 314 is in the same cabinet, and is also hollow and chipped, but of small size. The base is indented, and the figure might pass for one of flint. Fig. 318 also belongs to Dr Amidon. It is triangular, and both the long edges are sharp. On the reverse it is concave. Dr Getman found a flat and triangular bone arrowhead on the St Lawrence site, Sep. 21, 1901. It is $1\frac{3}{4}$ inches long and has an angularly shouldered base.

Fig. 323 is a fine hollow, cylindric horn arrow, sharp and polished. It is from an early site near Clifton Springs, and is in the Coats collection. Fig. 345 is a notched horn arrow from Rice's woods. It is rounded, not hollow, and the point is a little bent and obtuse. Most of these arrowheads are of horn.

Fig. 73 is probably a flat bone arrow, of a long, pyriform outline and indented at the base. It is grooved on one surface and merely notched on the other. This polished article was found in the ashes on the *Kaneenda* site, on the Onondaga inlet. In the Waterbury collection is a hollow bone arrowhead, $1\frac{3}{8}$ inches long. There is another of these from Clifton Springs, in the Coats collection, and Dr Amidon has a fine one $2\frac{1}{2}$ inches long.

W. L. Calver reported one of these at Cold Spring, Putnam co., and 20 others from a grave on Staten Island in 1895. He also had a hollow horn arrow from a shell heap at Spuyten Duyvil creek. Similar forms are found abroad.

A bone arrowhead from Hochelaga, at Montreal, is figured by Sir J. W. Dawson in *Fossil men*, p. 135, which closely resembles

the one in the Hildburgh collection. As Hochelaga was an Iroquois village less than 400 years ago, its articles closely correspond with those of New York.

Harpoons

Few early articles of bone or horn were more widely used than harpoons of various forms. Dr Charles Rau ably discussed and illustrated these in his *Prehistoric fishing*. One remark of his made as late as 1884 may well be quoted here, to show how important have been the acquisitions of the last few years. One barbed hook only had been reported then; now we have many, and the gain in harpoons has been yet more surprising, for most of these are older. Dr Rau said:

> Considering that bone, on account of its toughness, was an excellent material for pointing fishing darts, the comparatively small number of old bone heads thus far discovered in the United States would be surprising, if their scarcity could not be accounted for by their frequent loss in the water. *Rau*, p. 142

That they were lost in this way is certain, for they are sometimes found in the water now, but their destruction by small animals and their rapid decay when away from preservative materials may be more important factors. That more had not then been found was also partially due to imperfect modes of search. Dr Stewart of Lock Haven Pa., in a letter to the writer says of a harpoon found near the Susquehanna river, "It is the only point of bone found in this valley to my knowledge." Yet there are earthworks and village sites in Pennsylvania where the spade might be expected to reveal many. This is a matter to be tested.

Out of 28 bone harpoons figured by Dr Rau from the United States, 16 were from New York, and five from Onondaga county. Several came from the northwest coast. A. G. Richmond in a letter to the writer under date of Nov. 8, 1897, observed:

> I think Dr Hinsdale is doing remarkably. He has an immense number of things in the way of harpoons; the most I ever saw anywhere. I thought I was rich in the harpoon business, but he certainly goes away ahead of me. His are entirely different from mine. Mine are the one-sided ones, one, two and three barbs, all quite large; about 7 or 8 inches long and 1 inch wide. We don't seem to find the double-barbed pieces here. There is one place at Wagner's hollow, where I took you, where a great many of those large, flat harpoons are found. Some of them are broken, but mine are quite perfect and very good indeed.

The site mentioned is a recent one, and the form is that generally used by all the Iroquois in the 17th century. Dr Hinsdale's were mostly earlier forms, collected at two places, though he had them from other sites. A. H. Waterbury was equally successful in collecting at Brewerton. From these and other sources the writer has selected many fine, unique forms, much regretting the neglect of others.

Most European harpoons have larger barbs than those in America, and the Alaskan and Eskimo harpoons are perforated, like many recent Iroquois specimens. One from a mound in Manitoba has barbs only on one side. Eastern forms are found more or less in the western states, but those of California are more like those of Europe. Till very recently most of our bone articles were from California, a fact apparent in the national museum. The Toronto collection is much like that of New York, and the harpoons are the same. Harpoons seem rare in Ohio, but are found on the Madisonville site, which so closely resembles those of the early Iroquois. Its earthenware, however, differs greatly from that of New York. Bone implements are rare in New England, except in the shell heaps of the coast, but some double barbed harpoons have been found on Lake Champlain.

In New York bone harpoons are most abundant where the early and later Iroquois lived. Few have been reported west of the Genesee river, and along the Susquehanna and Delaware they seem unknown. The Hudson river and Long Island seem as barren. Dr D. S. Kellogg says that on Lake Champlain, "bone awls, punches and harpoons are found only in connection with broken animal bones and other remains in some of the fireplaces." These are in the early Iroquois territory, and thus the bone harpoon here seems limited to the drainage of the St Lawrence. Farther explorations may be expected to extend the area. In point of time it is both an early and recent article, with indications of continuity of use over but a brief period. At one time it seemed probable that those with double lines of barbs were much earlier than the larger forms, but both have now been frequently found on sites not four centuries old.

In the following descriptions harpoons will not be classified farther than the natural division of barbs on one or both sides. Both have

been found on the same sites and in the same graves. This is the case in Europe. Among the harpoons of the lake dwellers in Switzerland are those barbed on one and both sides. A Scandinavian specimen has barbs on but one. In New York, as a rule, this is a recent form when of a large size.

Fig. 234 is in the Bigelow collection, and is from a grave at Jack Reef on the Seneca river. In this were stone implements, two jawbones of dogs, and a flattened cylindric bone implement. There were also several double barbed ones. Fig. 238 is from the Richmond collection, and is a large and broad harpoon, with a central perforation and but one barb. Its striking feature is a series of short incisions at the base. Mr Richmond thought these were for marking pottery, but thongs of sinew might have been passed through them for attachment to the staff.

Fig. 239 differs widely from the last, and is in the Bigelow collection. There are nine large barbs on one side, and none on the other. The edges are nearly parallel and the barbs long. It came from the bank of Seneca river, north of Weedsport, and is dark brown, like most articles from that place. While generally well preserved, it is cellular on the reverse side. Fig. 242 is in the same collection and of much the same hue. It is from a recent fort partly on lot 8, Fabius, and is much curved the other way. There is but one barb, and no perforation. The lower part is abruptly expanded, as in some Seneca harpoons, and the edges are rounded, the general surface being flat. The barb is sharp and long.

Fig. 243 is a large and curious harpoon, much like a broad knife in outline. In one edge near the base is a large rounded notch, with a perforation lower down. The barb is so far from the point that it may be a knife, or at least have had a double use. It is from the north side of the river at Brewerton. Fig. 244 is of a very different character, and is in the Bigelow collection. It was found on Howland island in the Seneca river, and is triangular in section and highly polished. There are five barbs on one side, but what should be the point is obtuse, while the other end is slender and sharp. Dr Rau has an illustration of a slender one-sided harpoon used in arctic America, in his fig. 98, and describes its use. He quotes from Prof. Nilsson's *Primitive inhabitants of Scandinavia*, p. 33:

On the top of a long pole are fastened two tolerably long sharp-pointed bones, the tops bent a little outwards and the inner side provided with teeth pointing backwards, to hold the fish securely when struck. These bones are fastened to the shaft in such a manner that each, independently of the other, is in some way movable inwards and outwards; their sides are therefore flat at the other end, and the inner edge provided with one or more teeth pointing forwards, in order to be tied fast, so that they can not be torn away by the fish; and, in order to prevent their being bent too much apart, they are tied together by means of a strap at a short distance from the handle.

No long unilateral harpoons have been found here with these basal teeth, nor are they as long as those described by Prof. Nilsson. He adds that "the bone points, in all 11 inches long, are, to a length of 5 inches, fastened to the shaft, and consequently protrude 6 inches beyond it." It was his opinion, too, that these implements were not for spearing fish, but for shooting birds on the wing.

The Canadian Indians used something similar in early days, replacing bone or horn with iron when this could be had. The eel fishery was then of large proportions, and the *Relation* of 1634 describes the spear used in this:

This harpoon is an instrument consisting of a long stick, three fingers thick, to the end of which they attach a pointed iron, which they arm on each side with two little curved rods, which come almost together at the end of the iron point; when they come to strike an eel with this harpoon, they pierce it with this iron, the two sticks adjoining, yielding through the force of the stroke, and allowing the eel to enter; after this they contract again by themselves, because they were opened merely by the shock of the stroke, and prevent the speared eel from escaping.

The description of spearing eels by night, by Indians in lighted canoes, is precisely like that given by travelers in New York a century ago. Le Jeune adds that "some will catch three hundred, and many more, in a single night, but very few at other times." The French accounts of fishing at Onondaga lake far exceed this estimate. When they were there in 1655, Father Dablon said "some take with a harpoon as much as a thousand in a single night;" but then the size of fish stories is proverbial.

Fish weirs were quite generally used by the Indians, not essentially differing from those of the whites. David Zeisberger mentioned six of these between Oneida and Cross lakes in 1753. They

were all owned by the Onondagas, though the Oneidas made a claim to one or two of them at a later day. In the unpublished journal of that year Zeisberger tells us of his going from one to another on the Seneca river, Aug. 27. At the eastern one an Onondaga chief explained to him how the country was divided. He adds: "It is plain to be seen that they have much order in all their affairs. For instance, each one has his own place where he is permitted to fish, and no one is allowed to encroach upon his part. A chief is appointed to each fishing place, and he has his people who belong to him." This was necessary, for all parts of a river were not suitable for weirs and harpoons.

Fig. 245 is a harpoon in the national museum in Washington, much reduced, and is here taken from fig. 230 of *Prehistoric fishing*, where it is thus described:

A fine single-barbed harpoon head of elk horn, in an excellent state of preservation. It measures nearly 10 inches and a half in length, and has a thickness of about half an inch in the middle. The broad lower part shows two shoulders, but its base, instead of being worked thin, is more than $\frac{1}{4}$ of an inch thick. The head, nevertheless, may have been detachable. This specimen was presented to the national museum, with other valuable relics, by the late W. M. Locke, of Honeoye Falls, Monroe co., N. Y. His son, F. M. Locke, of Rochester, N. Y. informed me by letter that he had found it himself about two miles south of Honeoye, on the old Indian reservation called the Ball farm. "It lay on the surface where there had been a great many camp fires, and the clayish ground was covered with ashes, preserving the spear and other relics that might have decayed, had it not been for the ashes and clay."

Fig. 247 is in the Bigelow collection, and is a rare form from the Atwell fort. It has one long barb, and is much expanded above the base. It has a high polish, and is obtusely pointed at the base also, which is a rare feature. Fig. 249 is in the Frey collection, and comes from the Garoga fort in Fulton county. It is remarkable in being very slender below the barb, which is long and sharp. Fig. 250 is a long, curved and curious harpoon found in Cayuga county in 1889. There are two barbs on one edge very near the point. Fig. 254 is in the Coats collection, and is an early harpoon found near Clifton Springs. It is of a brownish hue, and has one long and sharp barb. One surface is ridged, and the whole implement is well wrought.

Fig. 259 is a curious example, found by Dr Hinsdale on the north side of the river at Brewerton. The general form is that of a broad and polished knife, pointed at one end and rounded at the other. The edges are rounded. There are two broad barbs on one side, and one narrow. The latter is not sharpened like the rest, and is formed by a half elliptic notch. The implement is broadest toward the point.

Fig. 268 was found at the mouth of Chittenango creek by Dr Hinsdale, and is blackened by lying in the water. It is a small and neatly made harpoon, with two small, dull barbs near the point. It is widest in the middle, tapering regularly toward the ends. Fig. 329 is as large as the last is small, but is much reduced in the plate. The length is $7\frac{1}{8}$ inches. It is from Rice's woods, and has a large perforation and two long barbs. It is a good example of the later Iroquois harpoons. These sufficiently show this class, but a few others may be noticed.

A large broken harpoon, with one barb and perforation, is $7\frac{1}{4}$ inches long, and comes from the Atwell fort. A recent fine harpoon was found on the site of East Cayuga in 1888, by W. W. Adams, and has appeared in print. It is stained red, has two barbs on one side, and the edges protrude near the base. It is $4\frac{1}{4}$ inches long, and is shown in fig. 354. In the Richmond collection is a massive unfinished harpoon from the Garoga site. It is $6\frac{3}{4}$ inches long. In the Frey collection is a broken single-barbed harpoon from the Otstungo fort. In the Vail collection is one which is unfinished and large, being $7\frac{3}{4}$ inches long. The notches had been begun. In the Waterbury collection is the head of a large unilateral harpoon, with one large and prominent barb. The length is conjectural. Dr Hinsdale found a curious broken harpoon on the island at Brewerton, which seems unfinished. The four barbs on one edge are very distinct, but their thickness on the outside is about the same as that of the whole implement. They have not been sharpened in the least. In the Hildburgh collection is one which is rude and broken. It is 7 inches long, and has six barbs on one side.

Fig. 240 in *Prehistoric fishing* is of a New York harpoon. Dr Rau said of this, p. 150:

A harpoon head of deer horn, tolerably well preserved but unfortunately broken at the lower extremity. The point and the two barbs are carefully finished; the perforation, sunk in from both sides, is of irregular form. A cross-section above it would form an elongated ellipse with a shorter axis of nearly half an inch. Found by Mr F. H. Cushing in a shell heap in Onondaga county, New York.

Dr Rau goes on to say:

It probably has been noticed that these pierced dart-heads have all unilateral barbs; those with barbs on both sides, it will be seen, are not perforated, but may also, in part at least, have been detachable. Perhaps it is only owing to accident that none of the bilaterally barbed heads at my disposition is perforated.

This is the writer's experience in the examination of a great number of specimens. But one bilateral harpoon has been submitted to him with a perforation, and of this he had at first some doubts from other unusual features.

In E. G. Squier's *Antiquities of the State of New York*, p. 124, is mentioned "the point of a fish spear, made of the ulna of the deer; found in Livingston county." This appears to be the harpoon which has long been in the state museum, and credited to Avon. It is about 5½ inches long, has two barbs on one side, and a half-circular notch in each edge toward the base.

A somewhat rare form of harpoon has the ends alike, with barbs pointing both ways. The natural thought would be that this provided for accidents. If one end were broken the other might be used. Another purpose has been suggested, to which this might be contributive at least. In *Cave hunting*, p. 111, W. Boyd Dawkins figures a double-pointed harpoon from the Victoria cave, Yorkshire, Eng. There are three barbs on each edge, but two of these turn one way, and the other in an opposite direction. Of this implement Mr Dawkins said:

The harpoon is a little more than 3 inches long, with the head armed with two barbs on each side, and the base presenting a mode of securing attachment to the handle, which has not before been discovered in Britain. Instead of a mere projection to catch the ligatures by which it was bound to the shaft, there is a well-cut barb on either side, pointing in a contrary direction to those which form the head.

But few examples of this form have been found in New York, and but one has been reported in Canada. Fig. 235 is the smallest

which has come to the writer's attention, and this was found by Dr Amidon at the St Lawrence site in 1899. Both ends are pointed. At one end there are two barbs on one edge, and one on the other. At the other end there are three barbs on one edge, and two on the other. One edge has thus three barbs, and the other five. It is expanded in the middle. Dr Amidon found a larger one, on the same site, Sep. 21, 1901. It is $4\frac{1}{2}$ inches long, and has three barbs on each side at one end, and four barbs on each side at the other. Thus far they have been reported from two places only.

Fig. 232 has lost both points, and may have been broken quite near these. At one end a barb remains on each edge; at the other there are two barbs on one edge, and there is one on the other. These are quite sharp. The flat surface is beveled at the edges. This is in the Waterbury collection, and was found at Brewerton. Fig. 263 was found at Brewerton by Dr Hinsdale, and is a perfect specimen, suggesting the use of the more distant barbs for attachment. At one end the bone forms an expanded angular head, with two barbs at some distance from this. The other end may be the true or primary point, with several barbs close to it. The upper side is mostly the natural surface, but the lower surface has also been smoothed. Fig. 321 is another fine example in the Waterbury collection, of which the lower side is here shown. This has been smoothed down, but shows the structure of the bone. The barbs are less prominent at one end than the other, but equally sharp. The larger barbs seem near the primary point.

Fig. 233 was found on the island at Brewerton by Mr Waterbury in 1899. It was with a skeleton. The point is obtuse, and the three barbs on each edge are very prominent. The general form is flat and broad, with a ridge on one side. Fig. 231 was found with fig. 234, and is in the Bigelow collection. It is flat, and beveled at the edges. The writer furnished figures of these two and another, to Dr Rau. They are fig. 229, 247 and 248 of *Prehistoric fishing*, and were found in a grave on the Seneca river. Fig. 266 was also found in a grave at Jack Reef, on this river. Several were with it, which were utilized in husking corn. One long and broken one had many barbs on one side.

Fig. 236 is one of many similar examples in the Waterbury collection. They are usually a little ridged, often broken, and with many small and irregular barbs on both sides. Fig. 237 is a rude harpoon found on the site near Pompey Center. The barbs are mere projections, and of unusual form. Fig. 240 is large for a bilateral harpoon, and has three barbs on each edge. It is of horn, and the natural hollow is preserved, the edges of this being neatly worked down. This was found by Dr Hinsdale on the island at Brewerton.

Fig. 241 is of unusual form, and was found by Dr Getman near Chaumont. It is a thick harpoon head of bone, with a single and large barb on each edge. The base is rounded, and the article perfect. Fig. 246 is in the Waterbury collection, and was found by him in 1899. It is nearly flat and very long. Three barbs on each edge are very near one end. Fig. 248 is in the same collection, and is a fine bone harpoon of unusual form and well preserved. The surface is flat and beveled on each side. The slight and sharp barbs are quite far apart, and the point of the harpoon is very keen. Fragments of these are found, but few good specimens.

Fig. 251 was found north of the river at Brewerton by Dr Hinsdale. It is very long and flat, with many sharp barbs crowded near the point. There are six of these on each edge. It expands from the point to the base, which is nearly an inch wide. Across this are shallow cuts, as though it had been intended to make the base square. Fig. 252 was found by the same person and in the same place. It is about the same length as the last, but narrower. The barbs are different, and there are four on each edge. The edges of both are rounded.

Fig. 253 is a fine bone harpoon, of unusual form for an Iroquois site. It is in the Dann collection at Honeoye Falls. There is a single barb on each side, both having a slight indentation half way from the point. From the notch below the barbs there is a gradual expansion to the rounded base. It is of a flattened form. Fig. 255 is a curious little bone harpoon, found by Dr Hinsdale on the Christopher site. There are four rounded or obtuse barbs on one edge, and five sharper ones on the other. It is a little ridged on one surface, polished on both, and with an outline much

curved. Fig. 256 is a small, pointed implement of horn, from Indian Castle in the town of Pompey. Midway on each side are three notches, which may have served for barbs, or for attaching this little implement to a handle. Fig. 257 is a bone harpoon found by Dr Hinsdale at Brewerton. It has the frequent flat surface, angularly beveled down to each edge. The barbs are made by mere sloping notches, and may be unfinished. They are serviceable as they are, but would be improved for use by cutting from the point of each barb to the base of the notch above. The base is broken, but seven barbs remain on each side. Fig. 258 was found by Dr Getman at the mouth of Perch River bay. It is a thick, rounded bone harpoon, with three sharp barbs on one edge. On the other the third barb has been broken, and then recut into two smaller ones. The original barbs on that edge are very sharp.

Fig. 260 is in the Waterbury collection, and is an unusually broad form. The figure shows the concave side of the bone. On this side it was customary to smooth the edges and grind down the point. If the bone was flat, much of the natural surface would be left on the other side. This has three sharp barbs on each edge, placed well apart.

Fig. 262 is in the Richmond collection, and is one of the prettiest bone harpoons yet found in New York. It came from an early site on Farley's point, Cayuga lake, and is polished all over and brought to a point at each end. It is very slender, and has six barbs on each edge. It is also slightly ridged. Fig. 264 is another bone harpoon with crowded barbs, from the Waterbury collection. It is moderately flat, but follows the curve of the bone. There are seven barbs remaining on one edge, and nine on the other. Fragments of about this size are frequent. Fig. 265 is in the same collection, and is well worked. It seems to have been a harpoon cut down to make an awl, but may also be supposed to be a harpoon in process of formation. The former is most probable. Fig. 277 is a bone harpoon found by Dr Hinsdale. The base is broken, but three peculiar barbs remain on each side. The point is rounded and the work good.

Fig. 270 is a fine bone harpoon in the Bigelow collection, which came from the Christopher site. There is a large barb on each side,

and the base is rounded. The shaft is much narrower than the barbs. Fig. 308 is a bone harpoon found by Dr Amidon in Jefferson county. It is a rather flat and long piece of bone, worked on the under surface below all the barbs, of which there are four on each edge, small but very sharp. On one edge a barb was commenced and broken off. To correspond with this none was attempted on the other edge opposite.

In the Waterbury collection is a large and flat bilateral harpoon which has been broken. Some sharp notches make the barbs. All the harpoons and most of the bone and horn articles in this collection are from Brewerton. Dr Hinsdale found there a horn harpoon, much dilated in the center, and with two barbs on each edge. It was $4\frac{3}{8}$ inches long, with a central width of $\frac{3}{4}$ of an inch. His best harpoons were from Brewerton, but he obtained many broken ones from Onondaga lake. The conditions there were not favorable for fine specimens.

Fig. 320 is a perfect and ridged harpoon, found by Oren Pomeroy in the pit at the St Lawrence site. It is worked also on the flat side, and there are three barbs on each edge. In the Woodworth collection are many of the harpoons of Jefferson county, with barbs on one or both sides. A bilateral one ends in a sharp awl at the base, which is an unusual feature. Some are indented, and are not strictly barbed. Dr Rau's fig. 241 is a harpoon from Ontario county, N. Y., presented to the national museum by Col. E. Jewett, which is about $4\frac{1}{4}$ inches long. He describes it as "a dart head with three small barbs on each side, so placed that they alternate. The upper side is rounded; on the lower one the cavity of the bone reaches from the broken lower end to the lowest barb." It is a characteristic New York harpoon, few of which he had seen, and he adds in his usual cautious way: "I would not venture to say more concerning the use of this dart head, than that it was probably employed in the fish hunt." *Rau*, p. 150

Dr T. B. Stewart sent the writer a good figure of the only harpoon of which he knew in the Susquehanna valley in Pennsylvania, nor have any been reported from that drainage in New York. It was 4 inches long, with sloping linear incisions, as though unfinished, and was found in 1898. He wrote that it "is in section triangular,

and barbed on two edges; the other side is smooth. It is well preserved." It is not very wide, and the edges are nearly parallel.

Fig. 269 is in the Bigelow collection and from the Christopher site. Its unusual character led to special care in verifying it, and the finder was willing to make an affidavit regarding all circumstances. The barbs, if they may be so called, are of unusual form, though such have been found in less pronounced examples. They are pointed protuberances, having nothing of the usual slant, and yet intended to retain the hold obtained. This kind of barb is found at Brewerton. There is a perforation near the base, of an elliptic form. This is a frequent feature at this site and those of corresponding age, in unilateral harpoons and other articles, but not belonging to American bilateral harpoons. The material is horn and therefore antique. There is no appearance of alteration after it was made. This is frequent where early articles of value have been broken, leading to repairs and farther use by the aborigines. This has the original character, and the work does not differ from that of accompanying articles. The evidences of its age have been duly weighed and are decidedly in its favor. The surface shown is smooth and follows the natural line of the material. The other surface is concave and has been a good deal worked. Fig. 352 is in the same collection, and from the same place. It is a thick unilateral harpoon with a single barb, and is much weathered. Fig. 355 is in the Waterbury collection, and has the barbs but slightly developed. Others of this variety are found at Brewerton, where broken implements often have odd features. Fig. 350 is from the Christopher site and in the Bigelow collection. The general outline suggests a flat and rather thin harpoon, with two obtuse barbs on one side and two on the other. It is sharpened to a broad edge at the point.

Fishhooks

In 1884 Dr Rau published accounts of a series of 11 hooks of bone found east of the Rocky mountains, ending with a figure of the only distinctly barbed hook of this material then known. It was furnished by the writer and was then supposed to be of horn, but later examination proved it bone. The first of the series was a simple bone hook from Dakota, apparently not old. It had

neither barb nor terminal knob, and is of a type found on historic sites in New York, as well as those but little older. A corroded one from the Madisonville site in Ohio is older in appearance than others from that place, but this is the result of position rather than age, as may be seen from Dr Rau's account of another with a well cut groove at the top. It was found at the same place. He said: "This hook presents a perfectly fresh appearance, being almost white, and is of excellent workmanship and well polished." *Rau*, p. 127. Another from this spot was perforated at the top — a rare feature. Hooks seen by the writer from that place in general can not be distinguished from similar specimens in New York. There is little reason, from the form, to call any of them old. Other things suggest age. Three out of the 11 hooks were from New York, and other types have been added since.

Dr Rau did not class Schoolcraft's bone fishhook as a barbed hook, though it certainly suggests this. The latter writer said that it was found within an earthwork on Cunningham's island in Lake Erie, and added: "Within these inclosures have been found stone axes, pipes, perforators, bone fishhooks, fragments of pottery, arrowheads, net sinkers, and fragments of human bones." *Schoolcraft*, 2: 87

Soon after furnishing this figure to Dr Rau, the writer himself found a sharp and well preserved barb broken from a hook. Then the figure of another was sent to him from Jefferson county; then he met with a large one at Toronto, and since then several of the barbed hooks have been found, mostly in the Onondaga territory. While they suggest a knowledge of the white man's arts in their barbs, it is a curious fact that all which can be dated are older than the period of colonization, though well within that of discovery. Those without barbs are both older and more recent, and of course sometimes contemporaneous with those having barbs.

In making a hook, the method was peculiar. With rude tools there was much danger of breaking, and this was carefully guarded against. A piece of bone was brought nearly down to the required dimensions for one or two hooks, and then ground to the desired thickness. Then work began on the inside by boring and cutting. The superfluous material was thus removed and the inside of the

hook formed. Most of the outside could then be fashioned in the same safe way, the critical point being the cutting away of the last outside support. Thanks are due to C. L. Mills, of Columbus O. for photographs of relics showing this progressive work.

A perfect series can not be given with New York specimens, but some may be shown of a distinct or conjectural nature. Fig. 85 was probably an ornament, but will serve to show how a hook might easily have been formed from it, had not the perforation been carried so far. Fig. 227 may also have been designed for an ornament, but may have been blocked out for a hook. In that case the cutting would have been from the half-circular notch downward till the point and curve were formed, and then upward along the shank. Almost to the last there would then have been a firm piece to hold it by. Dr Hinsdale found this on the island at Brewerton, where perfect hooks of about this size were obtained. Fig. 229 better illustrates the usual process, and has nearly the same outline as the last. It is in the Buffalo collection. A hole has been drilled toward the base, and from this grooves have been commenced for forming the point and shank. Fig. 230 is in the same collection, and may have been designed for either a large or a small barbless hook. The intended point seems to have been broken off, causing a change of plan.

Fig. 343 is from the recent fort near Pompey Center, and is a puzzling article if it is to be considered one which had been completed and then broken in using. It might have been a shuttle, had such an article then been in use, but this is unique in form and size. It is therefore suggested that the plan was to make two large hooks from one piece, dividing them in the center when sufficiently advanced. Unfortunately for this, it was broken at one end, perhaps in the mad license of the feast of dreams, perhaps in some accidental way. The curve of the hook is plainly seen at that end, while the work at the other is very suggestive. This article is reduced with the others on this plate, and is $7\frac{1}{2}$ inches long. For its length it is quite thin.

Most of the completed bone hooks are arranged on one plate; and for this reason fig. 313 will be mentioned first, being also of uncertain locality though owned near Syracuse. It is much more

massive than any others reported in New York, is without barbs, and has a slight groove at the top. It is also less angular than usual, and probably is much more recent than those which follow. The writer now definitely learns that it came from Michigan.

Fig. 209 is one of those published by Dr Rau, being his fig. 189. Like all the others, it is of actual size. Dr C. C. Abbott also gave the same figure in his *Primitive industry*, at an earlier day. It was found by W. Wallace Tooker in a shell heap near Sag Harbor. No others have been discovered on Long Island, and it is the largest bone hook yet obtained in New York. This is grooved near the top, forming a neat head, and the curve is well rounded inside. The basal curves, however, come to a point, greatly increasing the strength of the implement there. In this respect it is unique.

Fig. 210 is in A. G. Richmond's collection, and came from Richmond Mills in Ontario county. There is a recent site there. It is small, very angular, and without barb or knob, though the top is slightly curved. Fig. 213 belongs to Dr A. L. Benedict of Buffalo, and was found east of that city. It is thick, but quite small, and has neither barb nor knob. Fig. 226 is in the same collection, and was found at the same place. It is small, thick and very angular, and has a prominent head.

Fig. 217 is from Dr Rau's fig. 186, representing a barbless hook found by F. H. Cushing in the Shelby fort, in Orleans county. Dr Rau says:

> It is made of deer bone, and beautifully polished, especially at the point. The shank expands a little at the upper end, where there are some slight grooves. Viewed horizontally from the lower end, this hook shows in a slight degree the cavity of the bone. It was discovered in an accumulation of debris, 18 inches below the surface, near the center of an old circular earthwork. . . With it, Mr Cushing informs me, occurred various other remains, such as broken bones of animals, rudely ornamented potsherds, flint implements, awls, spatulae, portions of weapons and ornaments of bone and deer horn, shell and stone beads, etc. *Rau*, p. 125

This is the fort which some have argued is 7000 years old. The mention of spatulas suggests those of Jefferson county.

Fig. 218 is in the Buffalo collection and from a site on Buffum street. It is quite small, and the shank is nearly double the thickness of the rest of the hook. It is of the simplest possible pattern.

Fig. 220 is in the same collection and from the same place. It is large for this form, and slightly expands toward the top. Toward the point it is quite thick.

Fig. 219 is from the Atwell fort, and therefore not far from 300 years old. It is in the Burr collection at Cazenovia, and is both small and simple. Its importance is in giving a date to these simple forms. Fig. 223 is in the state museum, and is from Genesee county. It is small, angular and slender, and has no barb or knob. A broken one was with this. Fig. 228 is from West Bloomfield and in the Hildburgh collection. It is quite slender for its size. Two more are in the same cabinet and from the same place, one being broken. These are also quite recent.

Fig. 224 is a broken hook found by Dr Hinsdale at Brewerton. It has a projection at the top, but its great interest is in showing part of the initial perforation near the curve. This proves it to have been broken in making, which is hardly a matter of surprise when the crosscuts at the base are observed. The writer found one of about the same size and as much broken, on the fort site west of Baldwinsville. It can not be determined whether either of these had barbs, but there are good reasons for thinking they did. Fig. 225 is a large, sharp barb from a fort opposite the last mentioned, and south of Seneca river. It indicates a hook of very large size and fine form. The writer sent this to Dr Rau after his work was published, and he adopted the same view regarding its character. The site was probably occupied after the middle of the 16th century.

Fig. 214 is the first barbed bone hook reported in New York, and is a fine and perfect specimen, long in the Ledyard collection and now in the state museum. It is wider than any fish hook yet found, and came from the Atwell fort. The writer was so surprised at its character, when he first saw it, that he took special pains to verify the find. Dr Rau's figure is from his first drawing, made at Mr Ledyard's house; this one was made not long since, when it was for some weeks in his hands. It is of bone, and not of horn, as first supposed. This site is usually dated at about A. D. 1600, and other things there show the influence of white men's implements, though there are no examples of their work or materials.

Dr Rau said of this fine article:

The figure, representing a deer horn fishhook, is copied from a drawing kindly sent by the Rev. W. M. Beauchamp of Baldwinsville, Onondaga co. N. Y. This specimen was found, in 1880, by a laborer on what is called the Atwell site, in Pompey township, Onondaga (or Madison) co. N. Y., and is in possession of Mr L. W. Ledyard, of Cazenovia, in Madison county of that state. The hook being provided with a barb, Mr Beauchamp thinks that it was made, in imitation of the European fishhook, by an Onondaga Indian in the 17th century. There was an earthwork and ditch on the site, which has yielded deer horn forks or combs, bone punches, awls of deer horn, clay pipes, some of them exhibiting curiously intertwined human faces, pottery with human faces at the angles of the rims, and many other objects. The specimen here figured is the only regularly barbed fishhook of aboriginal manufacture known to me, and Mr Beauchamp's view as to its recent origin appears very plausible. *Rau*, p. 128

This fort belonged to the Onondagas, and has been ascribed to lot 44, Pompey. It is really just east of this in Madison county, and was apparently occupied at the end of one century and the beginning of another. The general character of this fine article is much like that of the old Kirby hook.

Fig. 211 is a hook which J. S. Twining bought of a boy named Pryor, who found it 3 feet deep in ashes on Dry hill, some miles south of Watertown N. Y. It is a large, fine hook, with a peculiar barb, and a knob at the top of the shank very neatly rounded. The Twining collection is now in the state museum. Brewerton has furnished several fine barbed bone hooks, described in this paragraph. Fig. 212 is the largest of these, and is in the Waterbury collection. It came from a fireplace on the island, and is narrow for its size. The barb is not sharp, and the top of the shank is a little thickened. Fig. 215 was found on the north side of the river by Dr Hinsdale. There were fish bones in the ashes with it. It is nearly flat, and the slight knob at the top has been broken off. Fig. 216 was found with this, and is a little larger. The sloping and small knob at the top remains. In both these the shank tapers to the top, and they probably had the same maker. Fig. 221 is in the Waterbury collection, and was also from the north side of the river. The barb and interior curve were mainly formed by the large perforation, leaving two straight lines to be cut to this. The

shank gradually expands upward, and then quickly contracts into a groove, above which is a small and thin head.

Fig. 222 is a curious and unique hook from the St Lawrence site in Jefferson county, where it was found by Dr Getman in 1899. It is large, and the shank is very much curved, which is a rare feature. Another distinction is made by two deep notches on one edge near the top. This site is of uncertain age, but was in the early Onondaga territory, whence all barbed bone hooks have thus far been reported. It is probable that a period of 50 years will include all these, and possibly much less. The bone hooks of all kinds here described are from Onondaga or Seneca territory, except the one from Long Island, yet it seems proper to credit Mr Cushing's hook and those from Buffalo to the Neutral nation, which occupied that territory at an early day. None have yet been reported from Oneida or Cayuga sites, but Mr Van Epps saw some hooks from an early grave 5 miles northwest of Schenectady.

The Toronto collection has the largest barbed bone hook which the writer has seen. It is 3½ inches high and has a very long barb. The shank gradually contracts toward the top, which has a distinct head. This was found in Lindsay Ont., Can.

Fig. 101 is a bone frequently found on the Atwell site, which suggests a hook. It shows little work, and was probably not used for this purpose.

Most European hooks figured in Keller's *Lake dwellings of Switzerland* are quite unlike those of New York, and those found in California are also of a different type. Early writers take notice of simple forms near the Atlantic coast, which may have been suggested to the natives by the gifts of earlier navigators. Those thus far found in New York may confidently be referred to gifts of this kind. The Madisonville site, in Ohio, has the simpler forms and is of supposed early date, but nothing has been reported thence which distinguishes it from an Iroquois village of the 16th century except the pottery, and even then pottery with handles occurs in New York. The hooks themselves certainly suggest that period, and it may have been an outlying Erie town, though usually considered a mound builders' cemetery.

That these hooks, wherever found, are due to some knowledge of

Europeans, may farther appear from accounts of early and recent Indian fishhooks. Sagard published his accounts of the Hurons in 1636, and described their ways of fishing.

We found in the bellies of several large fishes hooks made of a piece of wood and a bone, so placed as to form a hook, and very neatly bound together with hemp. *Sagard*, 3 : 588

Mackenzie traveled in northern Canada in the latter part of the 18th century. He said that the Slave and Dogrib Indians "manufacture their hooks from wood, horn or bone." *Mackenzie*, p. 37. The same writer said, in describing the Indians of the Peace river district, "Their hooks are small bones, fixed in pieces of wood split for that purpose, and tied round with fine watape." *Mackenzie*, p. 206. This was a thread made of small spruce roots. The hook itself is that of the early Hurons.

John Ogilby wrote of the New England Indians in 1671: "They then had *English* Hooks and Lines, for before they made them of Hemp, being most curiously wrought, of stronger Materials than ours, and hook'd with Bone-Hooks." *Ogilby*, p. 157. Kalm said of the Indians of New Jersey:

The *Indians* employ hooks made of bone, or bird's claws, instead of fishing-hooks. Some of the oldest *Swedes* here told me, that when they were young, a great number of Indians had been in that part of the country, which was then called *New Sweden*, and had caught fishes in the river *Delaware* with their hooks. *Kalm*, 1 : 345

This was in 1749. The assertions or inferences are that the native bone fishhook did not resemble that of Europeans.

Needles

The bone needles of Europe differ from those of the eastern United States and Canada, being usually perforated at one end, and quite sharp at the other. A few have a central eye, and some California examples resemble these. Ours are flat and thin, often rounded at the ends, and have one or two holes near the center. They could have been used only in some coarse work, and might well be called bodkins. It is probable that for finer stitching the bone awl was used, as a shoemaker uses an awl in leather, and that the hemp or sinew thread was carried through the hole as his is now. His is the survival of an early art.

In accordance with general usage, this slender and fragile implement will receive its common name here, bearing in mind the fact that all our own needles are not alike. We have those for knitting, netting and sewing, and even a needle which is true to the pole. Originally and practically the name meant something slender and pointed. The Onondagas now term the common needle *kine-wah a-ne-hong-wah*, nail or iron that you sew with.

Of needles and their uses Mr Morgan said:

A small bone near the ankle joint of the deer, has furnished the moccasin needle from time immemorial; and the sinews of the animal the thread. These bone needles are found in the mounds of the west, and beside the skeletons of the Iroquois, where they were deposited with religious care. This isolated fact would seem to indicate an affinity, in one article at least, between the Iroquois and the mound builders, whose name, and era of occupation and destiny are entirely lost. *Morgan*, p. 360

The mere use of bone needles would here prove nothing, for that is world-wide. It must be shown that others used the peculiar Iroquois form, which thus far seems doubtful.

Mr Morgan mentioned other needles. In making the Iroquois burden strap, he said, "the braiding or knitting of the bark threads is effected with a single needle of hickory." *Morgan*, p. 365. The stitching of canoes with bark twine or tough splints was of a ruder nature.

Mr Tooker has not found bone needles plentiful on Long Island, yet he had some from a *Hogonock* site near Sag Harbor, and says: "In a space 10 feet square, I found five bone needles," accompanied by articles of stone. In his Brooklyn address he used this name. In Rau's *Prehistoric fishing* he called them perforators. They occur on the site of Hochelaga, at Montreal, as might have been expected, and in Canada north of Lake Erie and Lake Ontario. They are found on the Madisonville site in Ohio, if the name is applied to the Iroquois type, but how frequent they are elsewhere in that direction is uncertain. Dr Rau figured none in the collections of the national museum. However they may have been used by others, they were still an Iroquois implement far within the historic period. This would argue a use for which the steel needle was not required. The perforations show that the thread used was not of a large size, and Indian women were expert in making fine

thread. For some uses sinews were required, and for coarse work the inner fibers of bark were used, but the writer has seen very fine Indian thread made from wild hemp, and twisted by merely rolling on the thigh.

Mr Van Epps reported a bone needle which he found at the early Cayadutta fort. It was notched at the head, and had grooves on each side between the eye and the head. It may be that this one had two holes and was broken at one, causing the notch. Perfect specimens have usually two points and a central perforation. One long needle in the state museum, is credited to Fort Hill, probably near Leroy.

John B. James reported two fine bone needles from Van Cortlandt park, in *Popular science news* for August 1896, and April 1897. They were 5¼ inches long, a very large size, and one was grooved in the eye, a frequent feature, probably resulting from the wearing of the thread.

Fig. 72 is a needle in the Dann collection at Honeoye Falls, and of the latter part of the 17th century. It is thin and a little curved, and is sharper at the ends than is usual. There are two small perforations quite close together and near the center. These are united and crossed by a narrow groove made by the thread. Fig. 109 varies from the typical form and is in the Waterbury collection. It is much thicker than is usual, has the perforation toward the broadly rounded end, and is broken at the other. As it tapers slightly toward the broken end, it may have been a perforated awl, and this is quite probable. Supposing it to have this character, it may be compared with fig. 7. Fig. 117 is part of a very long and slender needle from the Atwell fort. It has been broken at the perforation, and, if this was central, it would have had a length of nearly 7 inches. Fig. 118 shows one of two thin, flat and highly polished needles found by Dr Hinsdale on the island at Brewerton. Both were broken at the eye, and the remaining point is quite sharp. They were 3 feet deep in the ashes. Fig. 119 is in the Bigelow collection, and is a broken needle from Pompey. This has been broken beyond the eye, and the point is rounded. It is quite thin and a little curved. Fig. 120 has also a round point, and was found by Dr Hinsdale on the Sheldon fort in Pompey. It has been

broken at the eye, and has the usual flattened form. Fig. 123 is a flat and curved needle, found by Dr Amidon on the St Lawrence site. The ends are well rounded, and the perforation is not central. It is a fine and perfect specimen, though not a long one. Fig. 279 may be called either an awl or needle, having some features of each. It is sharp at one end and obtusely pointed at the other, but has a central perforation, slightly grooved across. It is wide for a needle, and is highly polished. This is from Pompey, and in the Bigelow collection. Probably it should be placed with the awls but may have had other uses. Fig. 280 is in the same collection and from the Christopher site. It is a long and slender needle, sharp at one end and with a rounded point at the other. The perforation is longer than usual, and probably enlarged by use. The groove which crosses it shows how constant was the wear. Fig. 281 is shorter and not so slender, but has much of the same character. These needles are usually flat on one side and a little rounded on the other.

Fig. 284 is from the Atwell fort, and may be an unfinished needle, lacking the proper points and perforation. It is thin and flat, and is somewhat curved. The edges are nearly parallel. Fig. 309 has a similar character. The thickness and curve are shown, as well as the flat surface. One end is pointed and the other left unfinished. In its present state, there is no perforation, but there can be no doubt that it was designed for a needle. This is in the Bigelow collection and from the Christopher site.

Fig. 324 is in one way unique, having one side straight and the other curved. The remaining point is also quite sharp. It was broken at the original perforation, which the groove shows was long used. Then a circular hole was drilled more toward the point, thus making a nearly terminal perforation. This had been scarcely used at all. It is in the Waterbury collection, and is half round.

Very few are perfect, as they are thin and narrow at the outset, and the perforations necessarily weaken them. Use increases this weakness, and they commonly gave way there. Broken forms, however, sometimes have special features, and are at least valuable in showing dates and distribution. Fig. 121 has already been mentioned as unique in form whether classed as awl or needle. It is probably

the former, being quite broad. A Mohawk bone needle is 3¼ inches long, and is quite wide in the middle, where there is the usual perforation. A round-pointed needle, broken at the eye and still 2½ inches long, comes from the island at Brewerton. Some with two eyes are broken at both. They occur on many sites and in many collections, but are often overlooked from their inconspicuous character.

Fig. 351 is a good example from the Christopher site, in the Bigelow collection. It is of bone, convex on one surface and concave on the other. Having been long in use, the point has been sharpened as occasion required. The other end is not now pointed and may never have been, though this would be unusual. It is cut squarely across, and this seems the original design. That half also does not follow the plane, as in most needles, but curves quickly out of the line.

Spoons

Iroquois spoons were usually made of wood, but a few have appeared that were formed of bone, horn or metal. Every man was expected to have his own, and to carry it to any feast to which he might be invited. Small sizes were provided for children, and larger for old people. They were broad, shallow, and often of quite a large size. The writer has seen an old Indian friend eating with one not less than 6 inches wide. Such a one may have given name to a noted Mohawk chief of 1660, who was called *Adaquatho*, or Big Spoon.

The Eskimo use horn dippers and spoons. Horn spoons were found in a grave in Windsor Ct.; and bone spoons were among early New England articles. Few have been found in New York, but some wooden and metallic ones have been taken from graves.

Fig. 134 is of bone, and was found on a recent site in Cayuga county, in May 1888. The handle is straight, on a plane with the bowl, and the whole article much like those made of wood. The latter, however, have the handle more at an angle, and generally carved in some ornamental design at the top. Fig. 344 is more like the usual forms in its curves, and is made of horn. It is reduced in the figure, and is a little over 7½ inches long. Viewed from the side, it shows a double curve, and the handle has several notches on

the under side, near the top. This was found near Fort Brewerton, and was shown by J. H. Horton at the Onondaga centennial exhibition.

Whistles and phalanges

Phalanges of deer abound on early village sites, often more or less worked. Many of these have a longitudinal and a lateral opening, and are commonly classed as whistles. Some have a single long perforation, and were probably used as ornaments. Others have a lateral perforation at one end, plainly intended for suspension. The writer has hesitated whether to separate these according to their supposed uses or to place them together according to their natural and slightly altered forms. The latter course is the least difficult and will be followed in this case, some reference to this being made on a later page. Most of the phalanges were probably used in a kind of cup and ball game, as they still are by some Indian tribes. The perforations served to connect them when so used. The common name of bone whistle has been retained here.

Fig. 142 is a neat article of this material, without lateral perforation, but with the ends cut in notches and polished. It was found by Dr Hinsdale at Brewerton. Fig. 203 is worked all over, and has a longitudinal perforation, and a lateral hole near the broad end. The form is like fig. 204, which has been already described as a bone pipe. The essential differences are in its being bored from end to end, and in having the lateral hole near the top instead of the bottom. It is from the Christopher site, and is in the Bigelow collection. The notch crossing the base does not show in the figure.

Fig. 205 is from the same place, and in the same collection. It is of the same form, but is smaller, and is very nicely worked. A scallop ornament of dots crosses one end. It is perforated throughout. Fig. 206 is a slightly worked deer phalanx, found by the writer at the Atwell site in 1896. It is perforated for suspension at the small end. Fig. 207 is a large phalanx, deeply notched each way at one end. This is in the Bigelow collection and from the Christopher site. There are abundant examples of these, varying in little things. One from the Garoga fort, in Fulton county, is well worked, and is perforated at the small end. Such forms may

have fringed the dress or anklets, as the hoofs of deer and sheep afterward did.

Fig. 102 is a small, cylindric bone whistle, belonging to Dr A. L. Benedict of Buffalo. The lateral orifice is toward one end, and is quadrilateral. Fig. 107 is a short, cylindric bone whistle, in the Bigelow collection. This is from the Christopher site, and the lateral central aperture is circular. Fig. 126 is from the same place, and was found by Dr Hinsdale. It is an angular, tapering bone whistle, with an angular orifice near the small end, and is not a common form.

Fig. 135 is from Rice's woods, near Stone Arabia, and has much the outline of the last, but is not angular. The lateral orifice is oblique and elliptic, and the whole surface is well worked. Fig. 208 is a hollow and polished bone, neatly cut at each end and triangular in section. It is of a deep brown color, like many articles from the Christopher site, and is in the Bigelow collection.

Fig. 326 is in the same cabinet, and is a very long bone whistle, hollow throughout. Grooves for a perforation have been cut nearly through on the opposite side, and the unfinished base has been partly cut off. The large aperture near one end is rectangular. The natural grooves appear on this and the next. Both are reduced on the plate, and each is $7\frac{3}{4}$ inches long. These were found at Jack Reef, Seneca river, with other bone implements. Fig. 327 differs little from the last, but the aperture is narrower and there are no cuts on the opposite side. Another was found with these.

Fig. 328 is a little larger cylindric bone tube, ornamented with parallel and cross grooves. It was found on Dry hill, near Watertown, where the barbed fishhook was exhumed. It is nearly 8 inches long, and one end is charred. Mr Twining furnished the figure, and thought the tube was made from a bone of the human arm.

Bone counters for games

Lacrosse and other ball games were purely those of strength and skill, but every article of value was often staked upon their results. Nation played against nation, and village against village, and the excitement was often intense. The passion for betting and gambling is very strong in the Indian character. So there was found among them the game of straws, analogous to our game of cards, but never

mastered by a white man yet. The game of the bones may have been less widespread, as played by the Iroquois, but the game of the dish or bowl everywhere prevailed, essentially the same in every nation, yet with frequent modifications. A good player of this had as wide a reputation as any chess player of modern times.

A full description of these is not necessary now, but a few words on them may not be amiss.

The Jesuits mention the game of straws among the Hurons in the *Relation* of 1636. Charlevoix gives an account of it as he saw it played in 1721:

> These straws are small rushes of the thickness of a stalk of wheat and two fingers in length. They take up a parcel of these in their hand, which generally consists of 201, and always of an unequal number. After they have well stirred them, making a thousand contortions of body and invoking the genii, they divide them, with a kind of awl or sharp bone, into parcels of 10: each takes one at a venture, and he to whom the parcel with 11 in it falls gains a certain number of points according to the agreement: 60 or four score make a party. There are other ways of playing this game, and they would have explained them to me, but I could understand nothing of the matter, except that the number nine gained the whole party. *Charlevoix*, 2:102

In this we find a pleasurable use for the long and sharp points of some bone awls. They were not merely useful, but were employed in their games of chance. We have another account in *New England's prospect*, describing the Indians there:

> They have two sorts of games, one called *Puim*, the other *Hubbub*, not much unlike Cards and Dice, being no other than Lotterie. *Puim* is 50. or 60. small bents of a foote long which they divide to the number of their gamesters, shuffling them first betweene the palmes of their hands; he that hath more than his fellow is so much the forwarder in his game: many other strange whimseyes be in this game; which would be too long to commit to paper. *Wood*, pt 2, ch. 14

The Indians near New York city were also fond of this game, which they called *senneca* in 1679.

Of the two games resembling dice the writer has given a full account in the *Journal of American folk-lore*, vol. 9. The game of peach stones, or the dish, he has played with Indians, and the Onondagas call it *ta-yune-oo-wáh-es*, throwing the bowl to each other,

as they take it in turn. Six peach stones are placed in a bowl, and the game is used at the New Year's feast, clan against clan. The stones are black on one side, white on the other, and five or six are the only winning points. Six make *o-hén-tah*, a field; five make *o-yú-ah*, a bird. This is the great game described in the *Relation* of 1636. Wood describes it as played in New England with bone counters:

Hubbub is five small Bones in a small smooth Tray, the bones bee like a Die, but something flatter, blacke on the one side and white on the other, which they place on the ground, against which violently thumping the platter, the bones mount changing colours with the windy whisking of their hands too and fro: which action in that sport they much use, smiting themselves on the breast, and thighs, crying out, *Hub, Hub, Hub;* they may be heard play at this game a quarter of a mile off. The bones being all blacke or white, make a double game; if three be of a colour and two of another, then they affoard but a single game; four of a colour and one different is nothing. *Wood*, pt 2, ch. 14

In the *Relation* for 1636 we are told that among the Hurons "both sides bet loud and firmly. When the one on the opposite side holds the dish, they scream loudly, '*Achinc, achinc, achinc*,' three, three, or else *Io-io, io-io, io-io*, wishing that he may throw only three white or three black."

A variety of this game is now played by the Iroquois with eight bone counters, or buttons of deer horn. It is probable that both were at first played with plum stones, so rarely are bone counters found on Iroquois sites. Our earliest account is of stones of fruit. In the domestic game eight bone or horn counters are used, but no dish. So the Onondagas call the game *ta-you-nyun-wát-hah*, or finger-shaker, the pieces being thrown from the uplifted hand on a blanket. The Senecas called it *gus-ga-e-sá-ta*. Six white or black count two, called *o-yú-ah*, or the bird; seven of a color count four, called *o-néo-sah*, or pumpkin; all white or all black gain 20, or a field, called *o-hén-tah*.

Fig. 163 is a Seneca gaming bone, which has been a little burned toward the edge. This is modern, and is in the Buffalo academy of science. Fig. 164 is from another set there, and has dots arranged inside the circumference. One side is red. Fig. 166 is also from Buffalo, but is an earlier and irregularly circular form. Fig. 168 is

similar, but larger and thicker. It is from the Atwell fort, and is a quarter of an inch thick. This is the oldest the writer has seen, and, while some small stone disks may have been used, it is more probable that fruit stones were the original Iroquois dice. They were in use when the game was first described. In some other states bone counters may have been exclusively used, and among the western Indians the dice themselves were of various forms. The Senecas called the peach stone game *gus-ká-eh.*

At an early day the Iroquois children had a game requiring pointed bones. A Jesuit remarked the likeness of Canadian Indian games to those of France.

> Among others, I have seen the little Parisians cast an arquebuse ball in the air, and catch it with a stick a little hollowed; the little savage Montagnards do the same, using a little bundle of pine branches, which they catch and pitch in the air with a pointed stick. The little Iroquois have the same pastime, throwing a small pierced bone, which they transfix in the air on another little bone. A young Iroquois told me this, seeing the Montagnard children playing. *Relation*, 1634

George Copway gives a brief account of both games among the Ojibways. First is the tossing play used indoors. An oblong knot of cedar boughs is made about 7 inches long, and to this a string 15 inches long is attached. By this the knot is swung. To the other end of the string a sharp stick is tied, which is about 2½ inches long. "This is held in the hand, and, if the player can hit the large stick every time it falls on the sharp one, he wins." *Copway*, p. 48

This is not very clear, and it is immediately followed by an account of a "bone play" indoors, which is no clearer. In this they use "hoof joint bones of the deer. The ends are hollowed out, and from three to 10 are strung together. In playing it they use the same kind of sharp stick, the end of which is thrown into the bones." *Copway*, p. 48, 49

However little we may understand this, we find in it a use for the worked and perforated deer phalanges not apparent before. At the Pan-American exposition good examples of these bones arranged for this game were shown, five or six in a set, much like those commonly called whistles. The broad and pointed awls with

central perforations for strings, may have been used in similar games.

Rattles

In all Iroquois dances and feasts the rattle in some form is indispensable; but none of these instruments will be figured here. Those familiar to the writer among the Onondagas are made of bark, turtle-shells, cows horns, and squashes or gourds. Strength is required, for they are not merely shaken but struck on a bench. Morgan's description of their use is good. Two musicians sit on the peculiar bench used and sing. "The rattles were used to mark time, and as an accompaniment to the songs. In using them they were struck on the seat as often as twice or thrice in a second, the song and the step of the dancers keeping time, notwithstanding the rapidity of the beat." *Morgan*, p. 280

The turtle-shell rattle is the favorite and ancient instrument, and the Senecas call this *gus-da-wa-sa*. Morgan describes and figures this, and his account is quoted:

To make this rattle they remove the animal from the shell, and, after drying it, they place within it a handful of flint corn, and then sew up the skin, which is left attached to the shell. The neck of the turtle is then stretched over a wooden handle. *Morgan*, p. 280

Mr Morgan gave a good figure of this instrument, which has been often copied. One made from a very large turtle is reserved for special occasions, being used only in the great feather dance and in the medicine dance with the false faces. It is carried by the chief of the false faces, and its use is quite exhausting. Its name includes two Onondaga words, *kah-nya-ten-go-nah*, big mud turtle, and *ka-sta-wén-sa*, rattle. Smaller ones are also used. The writer's is about the usual size of these, being a little over a foot in extreme length, and was taken from the snapping turtle. The main part of the handle enters the end of the shell, and is strengthened by two diverging splints of polished hickory, penetrating the shell midway in the back, while a similar single splint performs the same office below. It is proper to say that the names varied in the several dialects, and there may be some variety of usage. A moderate difference will be here observed between the Onondaga and Seneca words.

The bark rattle is a long, straight piece of bark, having the ends

and edges neatly turned over, and is rarer than the others. The horn rattle is modern, of course, being made of a cow's horn cut off at both ends. These are closed with wood, as in the bases of old powder-horns. The handle passes through both ends, but protrudes from but one. This rattle may be used in any dance.

Though not made of horn or bone the drums and another rattle may be mentioned here. The gourd rattle retains its natural pyriform shape, and is called by the Onondagas *a-e-tót-hah ka-sta-wén-sa*, the first word being the name of the medicine dance in which it is used. Mr Morgan does not give this prefix. No rattles or drums appear in a condolence, which is purely civic in character.

The Indian drum is *ga-no-jó-o* in Seneca, *ka-na-jú-we* in Onondaga, meaning a covered kettle. It is used in the war dance and many others, but never in the snake dance. The big drum is also used in the annual feast of the dead, held in the spring. Its size is that of a large keg, with the diameter of the old-fashioned churn. The smaller ones, of the size of small paint kegs, are used in most dances.

Knee rattles of deers hoofs were used in early days. The writer has seen sheeps hoofs employed as a substitute. A fringe of these was tied round the leg, and added to the noisy effect of the dance. When brass or copper bangles could be procured, these became substitutes or additional ornaments, and are yet found on Indian sites. The writer has seen conical rolls of sheet iron used in place of these. Every jingling or clashing ornament increased the desired noise of the dance. Some of the worked phalanges may have had a similar office.

Miscellaneous

A number of articles not easily classified will be grouped under one head. Some are unique as far as reports go; but others like them may yet appear, and one aim of these papers is to call out unknown material. In articles of horn and bone this is to be hoped for more than in other kinds. When we remember how great has been our advance during the last 10 years in a knowledge of these aboriginal relics in New York, and how much practically unworked ground awaits examination, we can easily believe that we are now only in the skirmish line, preparing for the later advance in full

force. Some now in the field will fall before that advance is made, but they may be assured that every early effort will have some later value.

Fig. 89 suggests a bone harpoon begun, but the slight notches are turned the wrong way. It is flat, and probably had a sharp point which has been broken off. The general form is that of a flat awl, but these slight and uniform notches arouse conjectures. Harpoons are not rare in the preparatory stages. This is from Brewerton, where these implements have been found in the greatest numbers.

Fig. 98 will introduce the reader to some implements of a puzzling nature. The one here represented is of horn, nearly half preserving the cylindric form, the rest of the long handle being cut into oblong facets, so that it becomes somewhat flat near the groove toward the lower end. This groove produces an irregular square, furrowed on one surface with deep longitudinal grooves. Mr Richmond obtained this in Rice's woods, near Stone Arabia, and thought it had been used in marking pottery. Those who have studied aboriginal pottery will see that such implements were not employed, though the suggestion would be otherwise probable. Such an implement would make parallel lines, and these do not strictly appear on native vessels. It might have been used in scraping hair from hides, but its value for this has not been tested. Had this been its use, more of its kind would have been found, but it seems quite rare. Fig. 338 is another of these, which is also of horn. It was found by Dr Hinsdale on the Sheldon fort site in Pompey. In the plate it is reduced, the actual length being $7\frac{1}{2}$ inches, and the greatest thickness $\frac{5}{8}$ of an inch. There are six deep grooves at one end, which are much longer than those in the Richmond example, and are not bounded by a cross groove. The sides are cut down so that it makes a rudely handled and abruptly curving tool. The writer thinks its most probable use was in preparing clay for the finer articles of earthenware. Its furrowed surface and peculiar form would fit it for this use. It is to be remembered that both these sites were occupied in recent times, probably about 1630, and are well supplied with European articles.

Two of these articles are in the Toronto collection, and both are of bone. One is $11\frac{3}{4}$ inches long and quite straight, the grooves

being on a line with the general surface, but on an expanded part of the implement. The other is more than half as long, somewhat curved, and with the grooved surface at an abrupt angle with the rest. Mr Boyle says: "Both are grooved at one end, as if to produce a pattern on something soft — perhaps for drawing lines to ornament articles of clothing." *Boyle*, p. 77

Fig. 110 is an unfinished angular bone article in the Buffalo collection. One perforation is complete, and another begun. They suggest the use of metallic tools. Two longitudinal grooves were also commenced. While this may have been an ornament, some things suggest an unfinished barbless hook.

Fig. 133 is a curious bone article found by Dr Hinsdale at Brewerton, suggestive of an adz. In outline it shows two sides of a rectangle. The ends are neatly worked at the edge, but not sharp enough for cutting. They could have removed charred wood. The general surface is large and flat, and the implement is thin in the shorter part. It probably had a wooden handle attached. It is a rare if not unique article here.

Fig. 160 was found by Dr Hinsdale at the same place. It is of bone, nearly flat, and quadrilateral. The outline is slightly curved, suggesting a hammer or double-bitted axe, but it is of considerable and uniform thickness. There is a central cross groove, and some notches at the edge. It may have been used for a sinker.

Fig. 161 is a bone ball from West Bloomfield, being one of the two in the Hildburgh collection. They are $\frac{3}{4}$ of an inch thick, and rare. Fig. 285 is a paint cup from the Christopher site, which is made from the base of an antler. It is moderately worked, and shows some traces of its former use. Fig. 299 is an example of some small bone bands in the Burr collection and from the Atwell fort. They look as if a groove had been carefully cut around near the top of a bone suitably prepared, and then a narrow ring of bone had been neatly separated. The Buffalo collection has some of these curious articles. The wonder is that they have so well endured a burial of three centuries. No opinion has been expressed regarding their use.

Fig. 322 is from the Richmond collection, and was found at Rice's woods. The site shows its modern character. In the figure

the implement is half its true length. From the tip of the fork to the chisel point is $7\frac{3}{4}$ inches, and from the same tip to the extreme point is $10\frac{3}{4}$ inches. It is an adz made from a deer's antler. The short prong is sharpened to a chisel edge, is nicely worked the entire length and is now very straight. One prong has been cut off, and another left for a handle. This is less worked, but it is a fine and rare implement. In the same collection and from the same place is an antler prong $10\frac{1}{2}$ inches long, cut off at the base, where there are several cuts.

Fig. 331 is a long and hollow bone found in a cache at Cayuga. It has been cut down by grinding, and thus laid open in the center. The orifice is $4\frac{3}{4}$ inches long, and the bone has a length of 11 inches. The joints are left at each end. It was full of red paint when found in 1886, and a small, elliptic sandstone pestle or muller, 3 inches long, lay along the opening. It is much reduced in the figure. Fig. 332 shows a fine bone mortar from the Garoga fort, which is in the Richmond collection. It is reduced in the figure, being $4\frac{3}{4}$ inches high, 2 inches wide at the top, and $1\frac{3}{8}$ inches at the bottom. It is excavated nearly to the base. The accompanying bone pestle has been already shown.

A large number of long bones from Ohio were in the Pan-American exposition, and were called scrapers. They were cut much like fig. 331, but more deeply, and probably had the use assigned. The Cayuga example was a paint box.

Fig. 342 is one of the rarest of all New York articles, being an implement made of a walrus tusk. It is curved, angular, and has been ground to a broad point at one end. The actual dimensions are 16 inches of length, and $1\frac{1}{2}$ inches of thickness, being nearly as wide throughout as at the thickest part. With it were found large bones and other relics, and a gouge of walrus tusk broken in two. Unfortunately this fine article is much weathered. It came from the early fishing place at Brewerton.

Fig. 349 is a novel implement in the Bigelow collection, and from the Christopher site. It is a well worked bone naturally deeply grooved on each side, but with the edges of the grooves ground flat. A rounding crosscut connects these at each end. The one at the basal joint is not conspicuous, but the other is very deep, form-

ing a curved and prominent horn on each side. Both these are ground to a rounded cutting edge, and might have been used for cutting strips of hide with parallel edges. The shorter horn has been split and recut, and both are ground from the inside, the natural curve of the bone remaining without. The edges are very slightly ground outside, and cracks nearly reach the base.

Fig. 353 is another novel article from the same site. It might be called a flat double chisel or gouge, being sharp at both ends. The material seems to be horn, and the edges are ornamented with notches. These edges are parallel, moderately deep in the center, and there are two circular perforations near the center of the implement. One surface is nearly straight, and retains part of a natural longitudinal hollow. The other curves, and has a deep, broad hollow, worked from end to end, as in the figure. This fine article may have been a shuttle, or have been used in some game.

A piece of horn has been cut off from an antler and partially worked. It is $5\frac{1}{4}$ inches long, and has been excavated on one side, perhaps for a paint box. This is from the Otstungo fort and is in the Richmond collection. The writer found part of an antler on the Wagner hollow site in Montgomery county in 1889. It had been neatly cut off and was partially worked, though most of the original surface remains. Toward the upper end broad diagonal grooves have been cut. It is $4\frac{3}{4}$ inches long by $1\frac{1}{2}$ inches thick. Copper saws were found on the same site.

A slightly curved bone implement is in the collection of H. A. Pride of Holland Patent. It was found in the town of Marcy, on the north side of the Mohawk river, and not far from Oriskany. The sides and edges are parallel, and it is $5\frac{1}{4}$ inches long and over an inch wide. The thickness is $\frac{3}{5}$ of an inch. Both ends are brought to a moderately sharp edge, suggesting a double chisel, but one of these has the characteristic feature of fig. 98 and 342. Parallel grooves extend from the end on one surface, for over an inch of the length, making a corrugated surface there. They are arranged as in the other examples, and probably had the same use.

In the collection of the Onondaga historical association is a bone spool, given to that society, Mar. 29, 1895, by Mrs Pierce, an Indian

woman. It was made by Harry, son of the noted Ephraim Webster, and is much like the wooden ones in form. Indian thread is wound on it. A folding bone toothpick in the form of a fish accompanied this and was made by the same chief. Some Indians at Onondaga have done fine carving in bone.

A hollow bone, nicely wrought at one end, perhaps for a box, was found at Brewerton. It is 2⅞ inches long by 1 inch broad. A long and curved bone is in the Buffalo collection. It is perforated at one end, and polished. The length is 4⅛ inches.

In treating of these things many fine articles have been passed over, because representative forms were needed, and even then the illustrations have exceeded in number those used before. Some are not so remarkable for form as for the high polish given centuries ago, and retained in the earth to the present day. The sharpness of some points is wonderful, and yet, aside from their daily use by their makers, these have often been preserved unharmed for over 300 years. In no class has the writer been so inclined to exceed his limits as in that of harpoons. They are so abundant and variable, that almost every fragment has a charm of its own. A large proportion are of course fragmentary, not strictly fine specimens, but each has its own features.

In some cases it has been difficult to distinguish horn from bone without marring the article, but this is a point of slight importance. Both materials were abundant, and it was merely a matter of choice or convenience which was used. Large harpoons were often of horn, and this seems to have been preferred for the hollow points commonly called arrowheads. Awls were usually made of bone.

The presence of certain bones and teeth is not without interest. In the refuse of the towns, jaws, teeth and bones occur, showing traces of the usual food of the people. Something might be gained in this way from a study of the implements, were this at all needed. Some remains of this kind are certainly suggestive. The presence of two walrus tusks at Brewerton may have resulted from aboriginal travel or trade. In one collection in Jefferson county the writer found a buffalo's tooth and the palate of a drumfish. Close inspection might show other strange materials. The local collector should

look well to these. They are not showy things, but are none the less valuable in revealing early life. A bare reference to them will suffice in this paper, which treats of implements and ornaments, and not of food.

To show how little was generally known of bone articles in New York but a few years since, reference may be made to A. E. Douglass's table of Indian relics in his fine cabinet, in 1896. He then had 36 bone implements, 17 of which came from New York. His 30 bone beads included no New York specimens, and but one of his six bone ornaments was found here. Of his 73 images, masks and heads of all materials, but eight were from the United States, and none from New York. The character of the collection is mainly the result of personal opportunities and limitations, and, because of this, some little known collections of a local character are very important in determining geographic distribution and illustrating rare forms. For a similar reason, it seems proper to quote David Boyle's remarks on bone articles in Canada, the home of the Hurons and Neutrals, who were kindred to the Iroquois of New York, and whose remains are directly related to those found here. Mr Boyle says:

Many tools and a few ornaments were made of bone and horn, but no weapons appear to have been produced from these materials, unless we include those known as harpoons having one or more barbs. On account of the extensive use of bone by the Eskimo, there is a strong temptation to refer many of our specimens of this kind to Innuit origin, especially as the resemblance of ours to theirs is often very marked. But, in this respect, there does not appear to be any more reason for so doing than there is for attributing the same origin to flints, vessels of soapstone and some other things. Still, when we take into account the Huron-Iroquois tradition as to the former abiding place of the nation on the north shore of the Gulf of St Lawrence, we may at once concede the probability of strong Eskimo influences affecting the work of our Indians. *Boyle*, p. 72

Mr Boyle seems to refer the early Iroquois to the north shore of the Gulf of St Lawrence, but the Eskimos lived there in historic times. The Iroquois made the unilateral harpoon of bone long after the whites entered New York, and the bilateral to some extent. The age and origin of many of these are clearly proved. Mr Boyle goes on to say of one fine article:

Barbed bone hooks are extremely rare. I have heard of two or three others, but this is the only one I ever saw. It is not too unreasonable to suppose "white" influence to have been here at work at a comparatively recent date. It has been noticed that articles made of bone are much more frequently found in some parts of the country than in others. In the Ottawa and St Lawrence counties few bone specimens occur. In the old Huron country they are comparatively rare, and not many are found in the western counties. On the other hand, large numbers have been collected in the neighborhood of Toronto, of Brantford, and in North Hastings county. Awls are the most common form of bone tool. They are from 2 inches to 8 or 10 inches in length. They are sometimes spoken of as needles, but it is most likely that their use was to perforate bark and skin before inserting the thong or fiber employed for sewing. Another form also known as a needle . . . was almost certainly employed in the netting of snowshoes, and in the making of grass mats, for passing the binding string or thong of sinew or root fiber in and out among the stalks of grass as they hung suspended from a bar in front of the worker. It is, therefore, more like a shuttle, although it was not *shot*. An unfinished Ojibwa mat in the provincial museum, yet attached to the original bar shows how the work was and is performed by the native women. *Boyle*, p. 73

This latter needle is the one known by that name in New York. It may be supposed that deeper excavations on village sites will reveal many articles of bone in the Huron country. European articles were so soon taken there that bone may have soon been disused on historic sites. This was not the case in the Neutral country. Mr Boyle proceeds:

As pins to fasten clothing on the person bone was the best material procurable, and it is not unlikely that many of the so called needles were employed in this way. Specialized forms are found occasionally on which some pains have been taken by way of ornamentation. . . Pins of this kind are generally spoken of as pottery markers, but as a rule the designs on Indian clay vessels required no special tool. Implements for dressing skins very effectively were made from the metacarpal bones of large quadrupeds like the moose, caribou and common deer. Some of these tools are quite smooth at the scraping edge, while others are neatly notched to give them additional grip. *Boyle*, p. 74

These are cut like a gouge or chisel, and the ornamented awls are like those of New York. So are the combs, beads, pendants and grooved implements. Carving of human figures and faces was recent; and Boyle says nothing of bone whistles there. Horn was

less used than bone, and some Canadian articles of this material have not been reported in New York. In his report for 1899 he speaks of a considerable number of phalangeal bones from old village and camp sites, adding that "the most commonly accepted theory is that the bones were in some way used as whistles, but nobody has ever been able to produce a sound from them." Most of his examples were found but a few miles from Toronto, and resemble some New York specimens. Stewart Culin is inclined to think they were used in games, and in this theory the Eskimo comes up again. Skull perforation in Canada was after death. The perforated horn articles which Mr Boyle supposed were used for straightening arrows have not been reported in New York. It may be that the artificially grooved boulders took their place.

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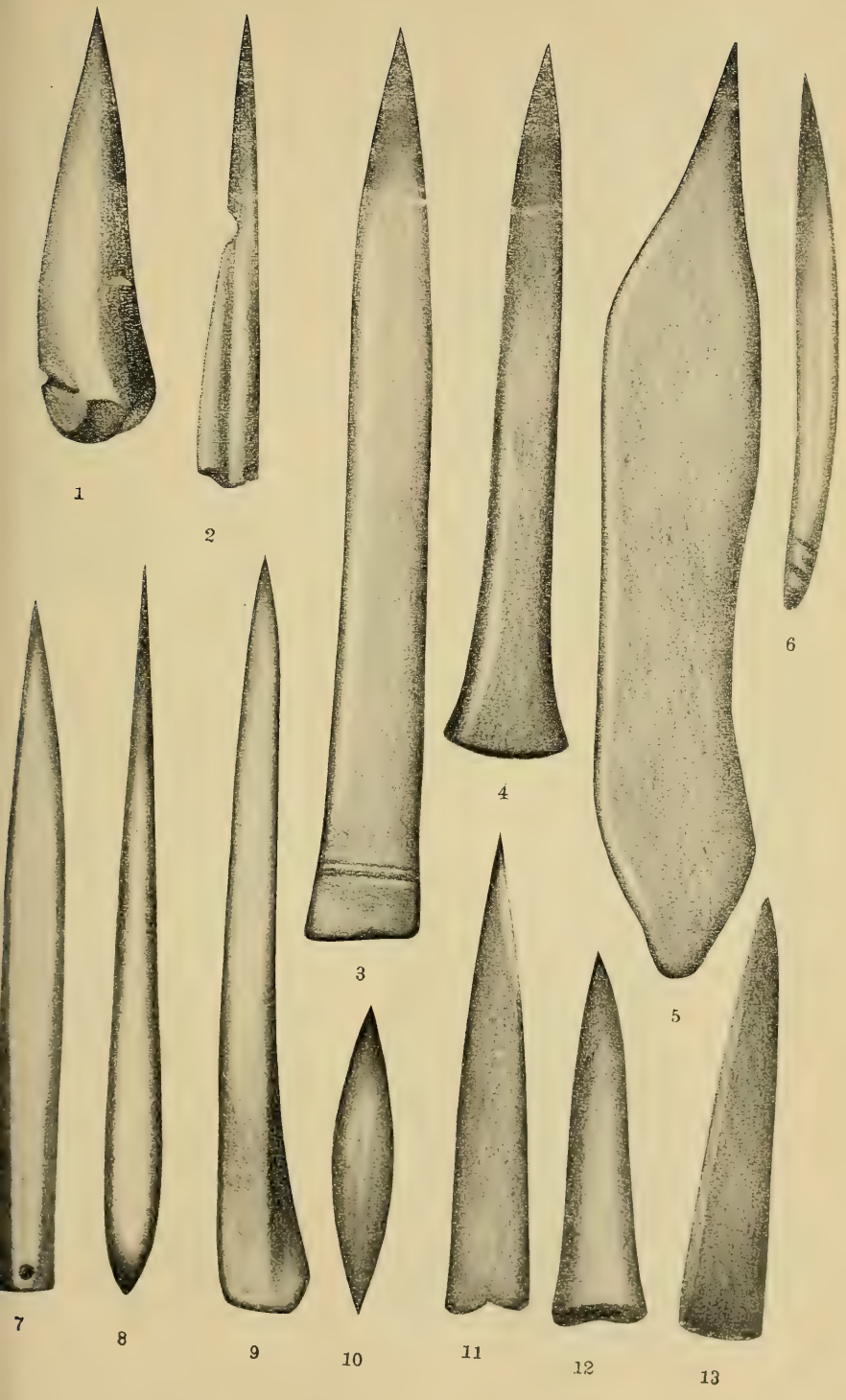
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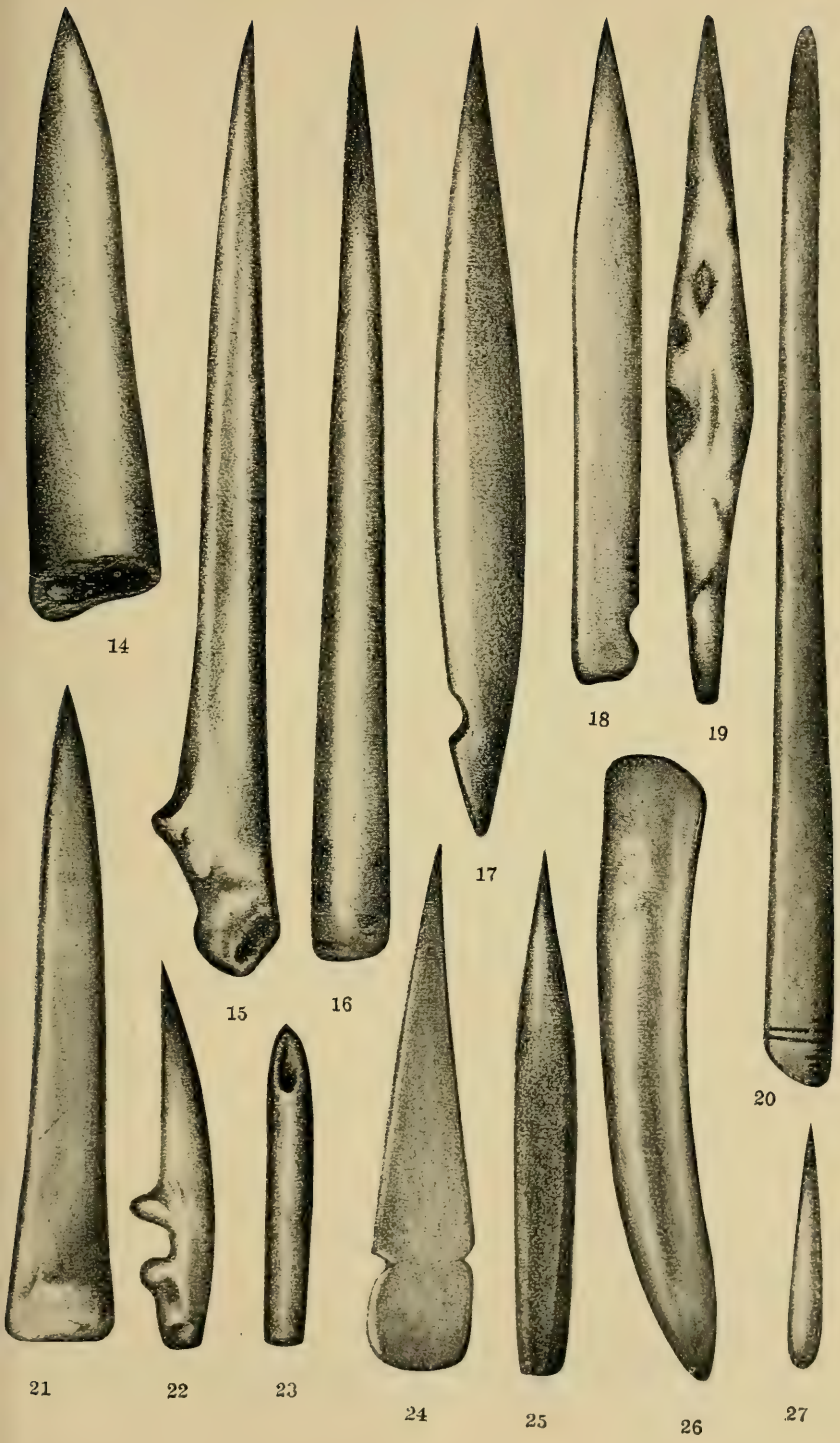
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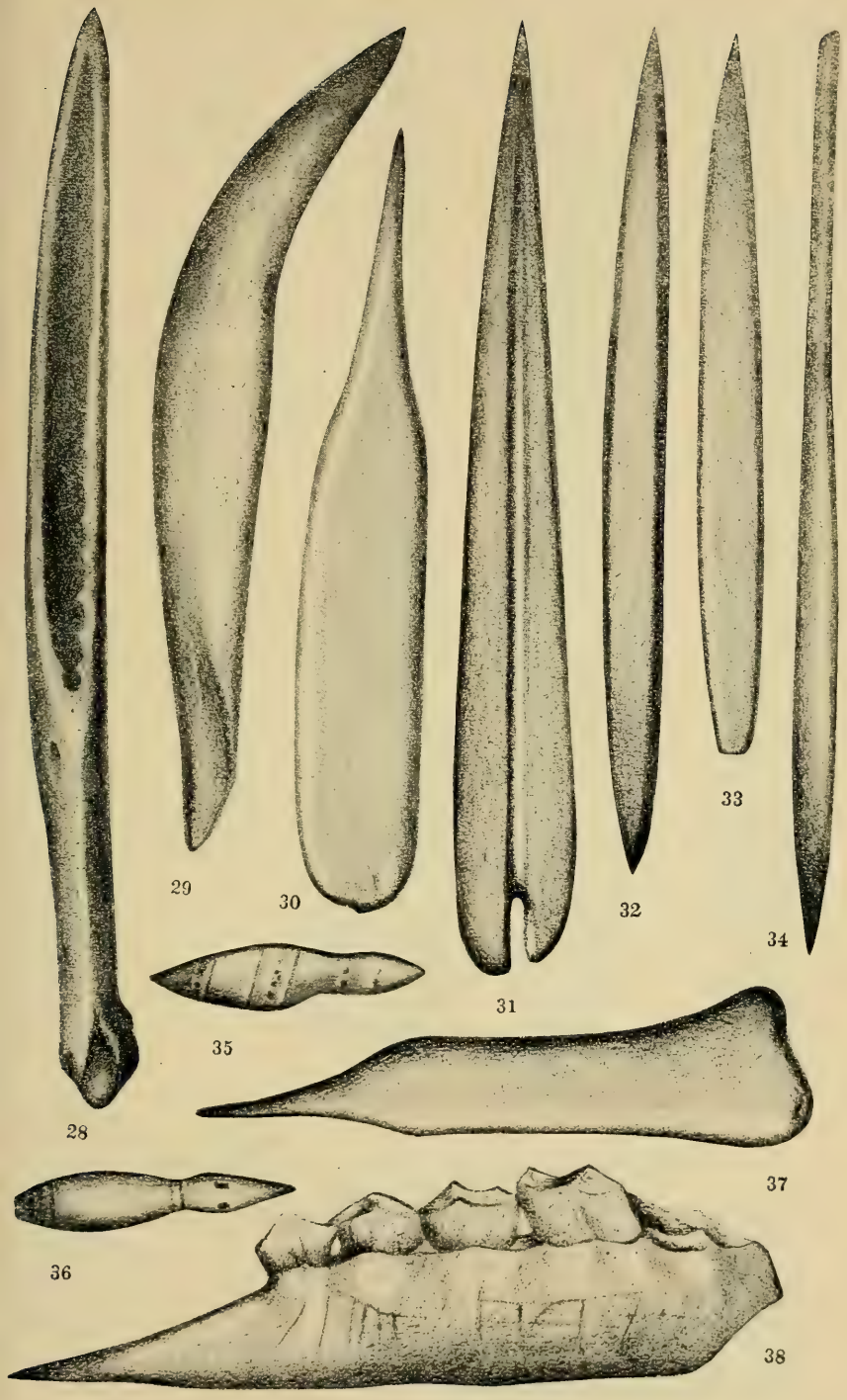
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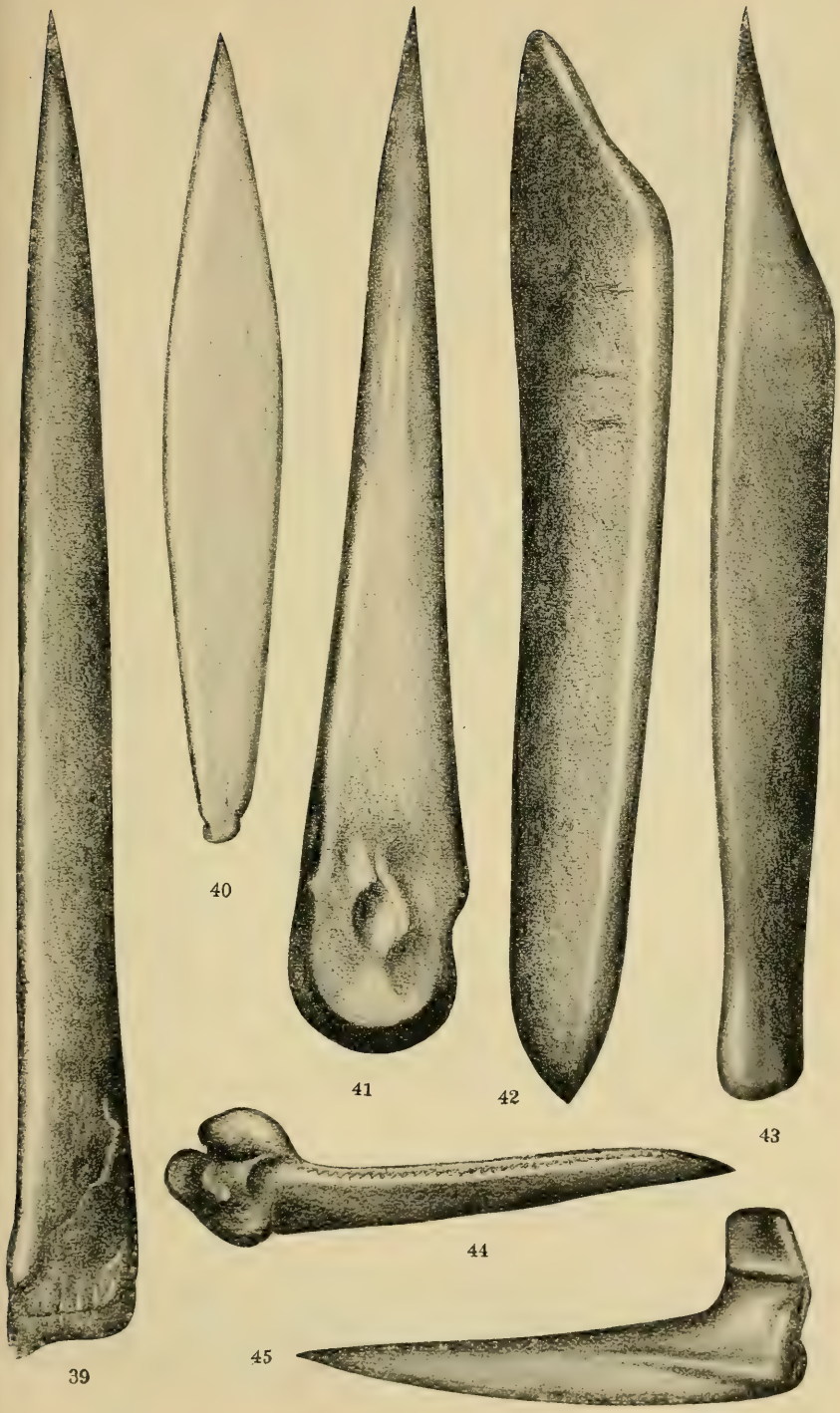
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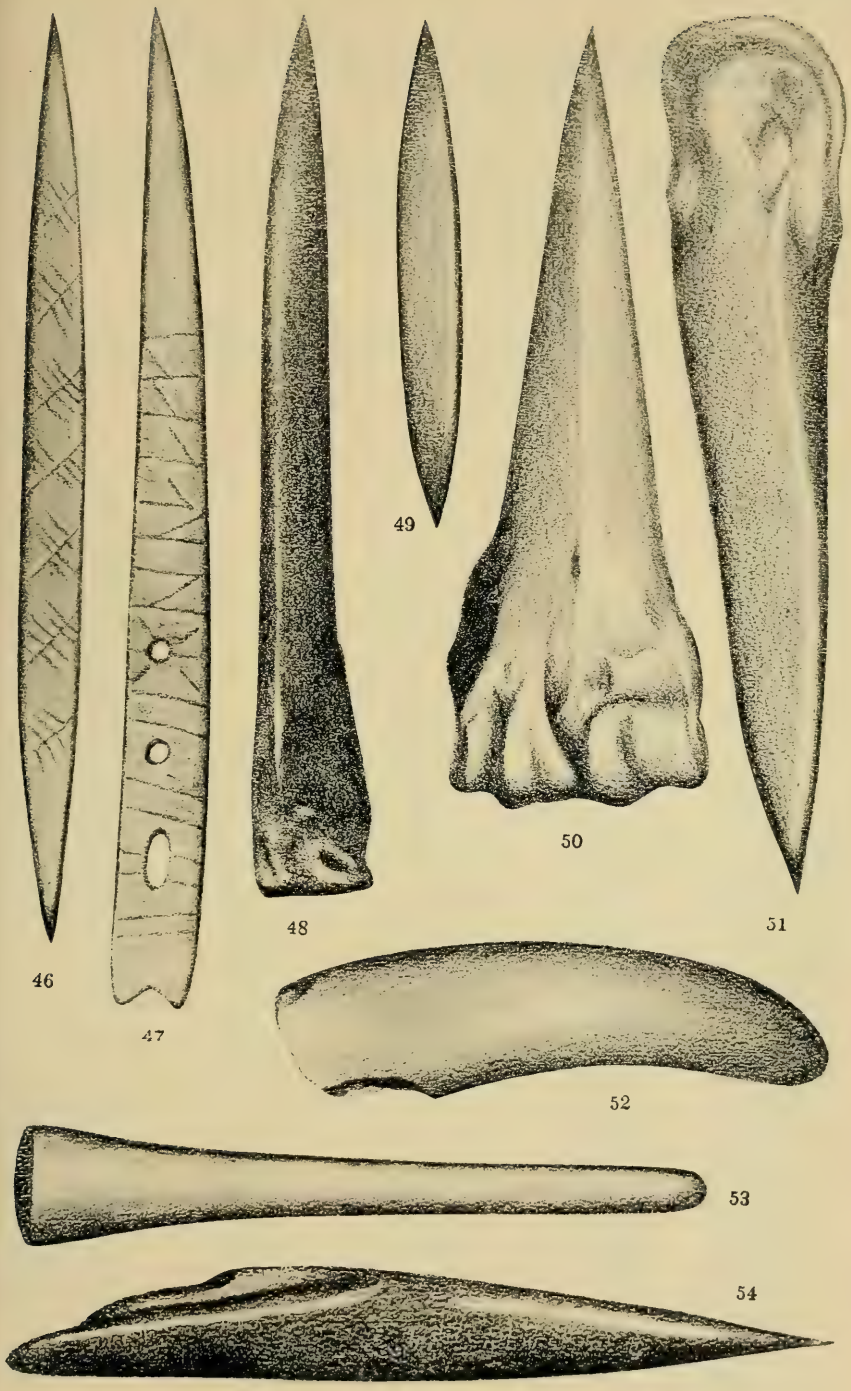
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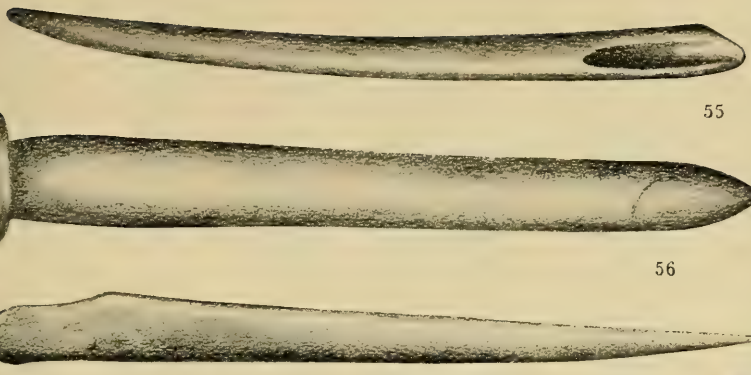

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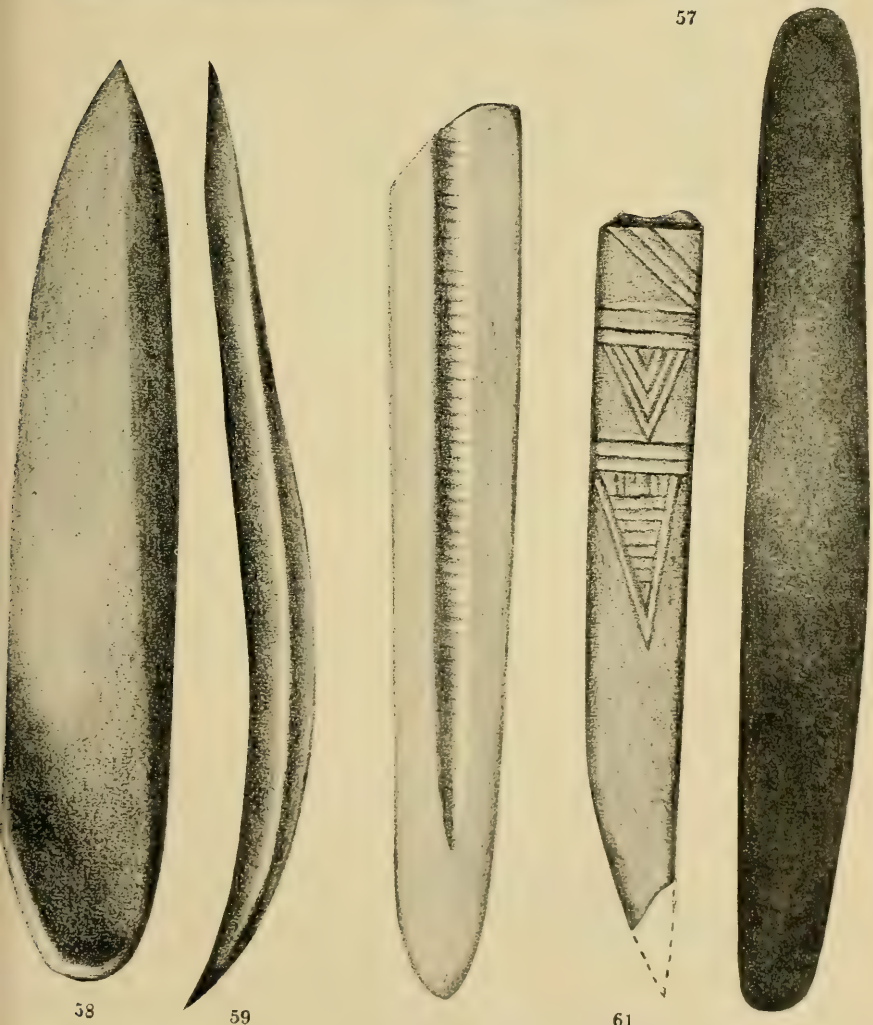

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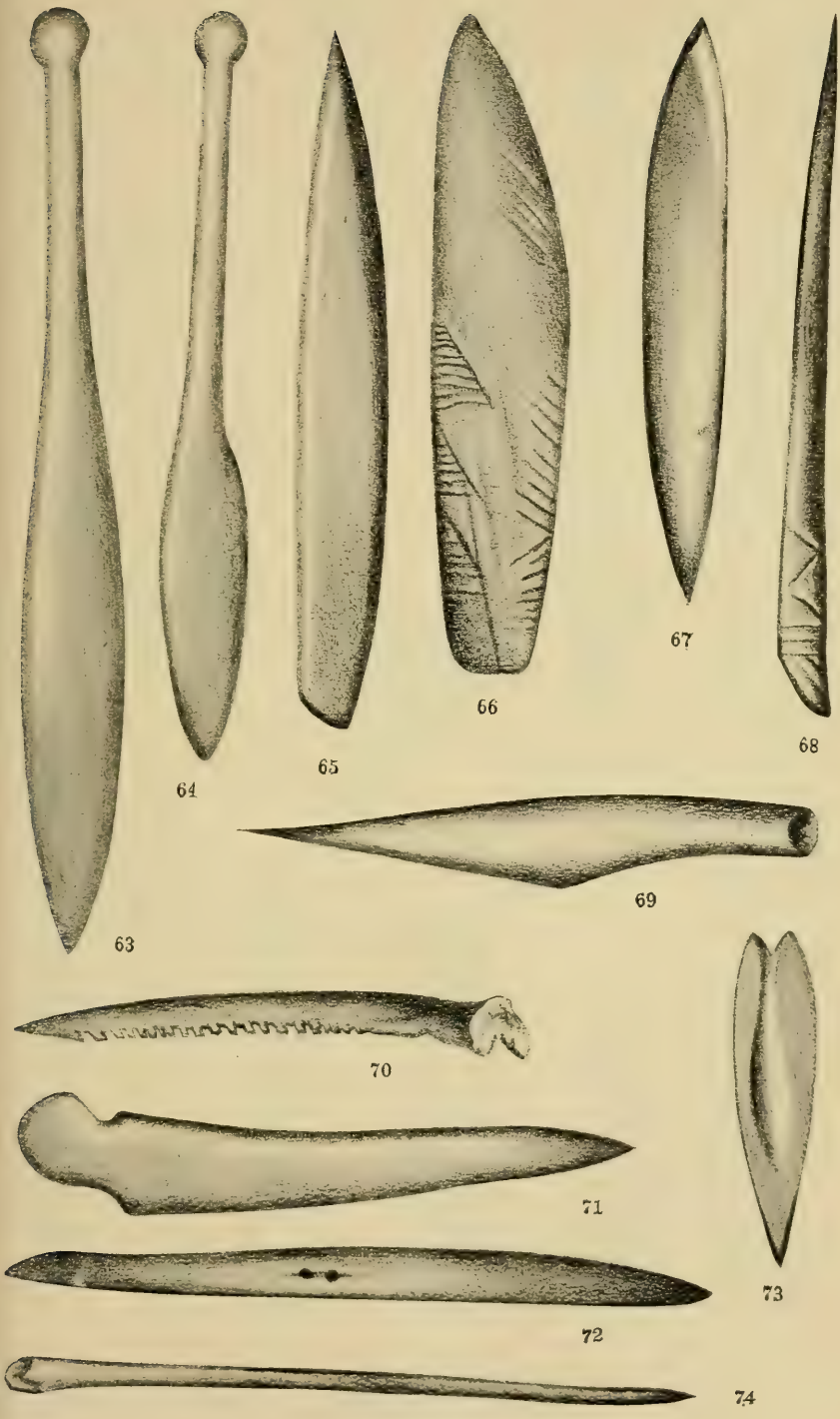
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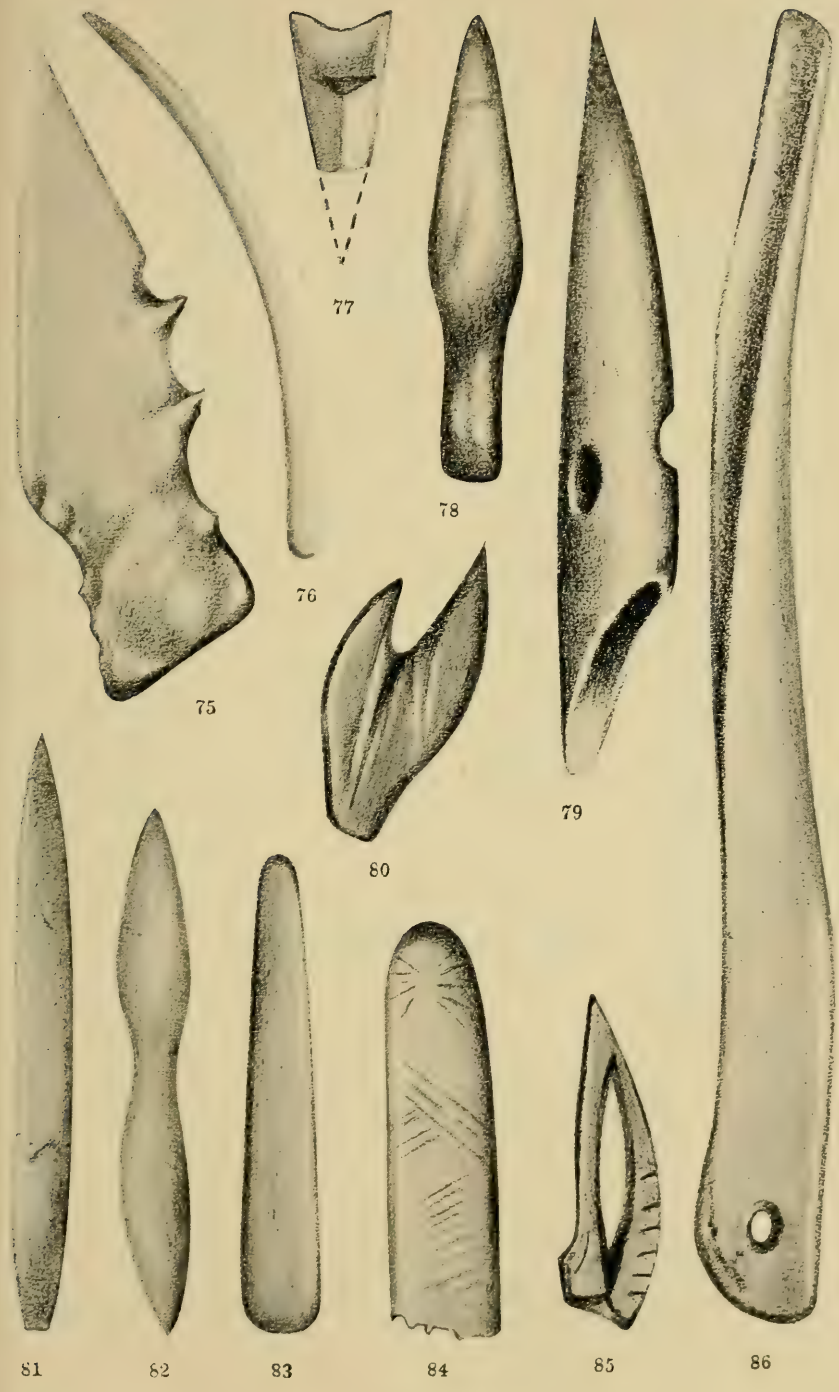
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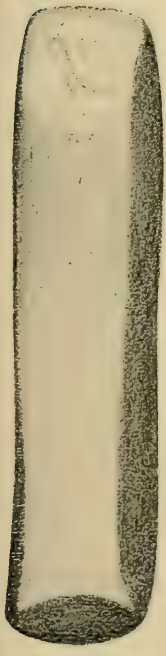

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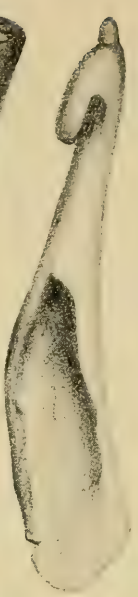

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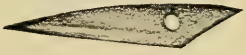

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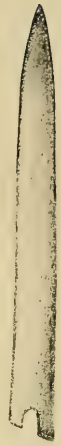

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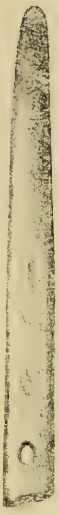

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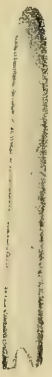

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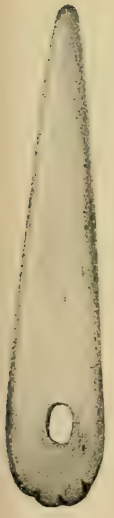

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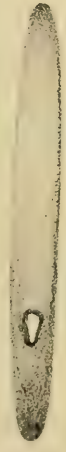

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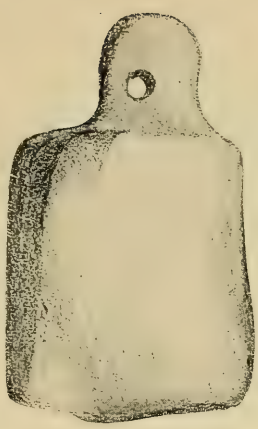

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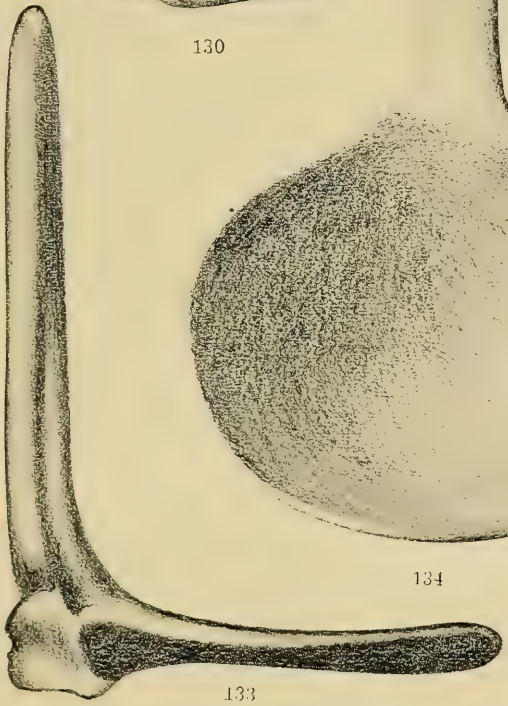

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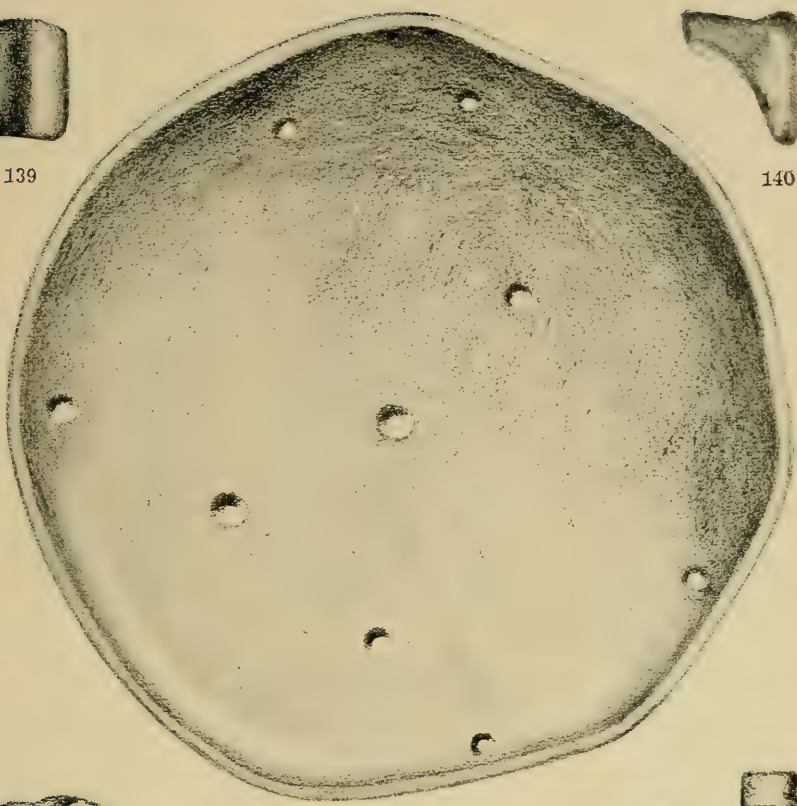

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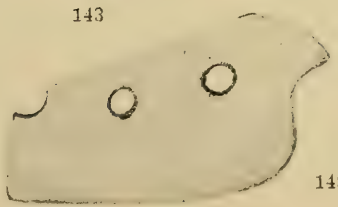

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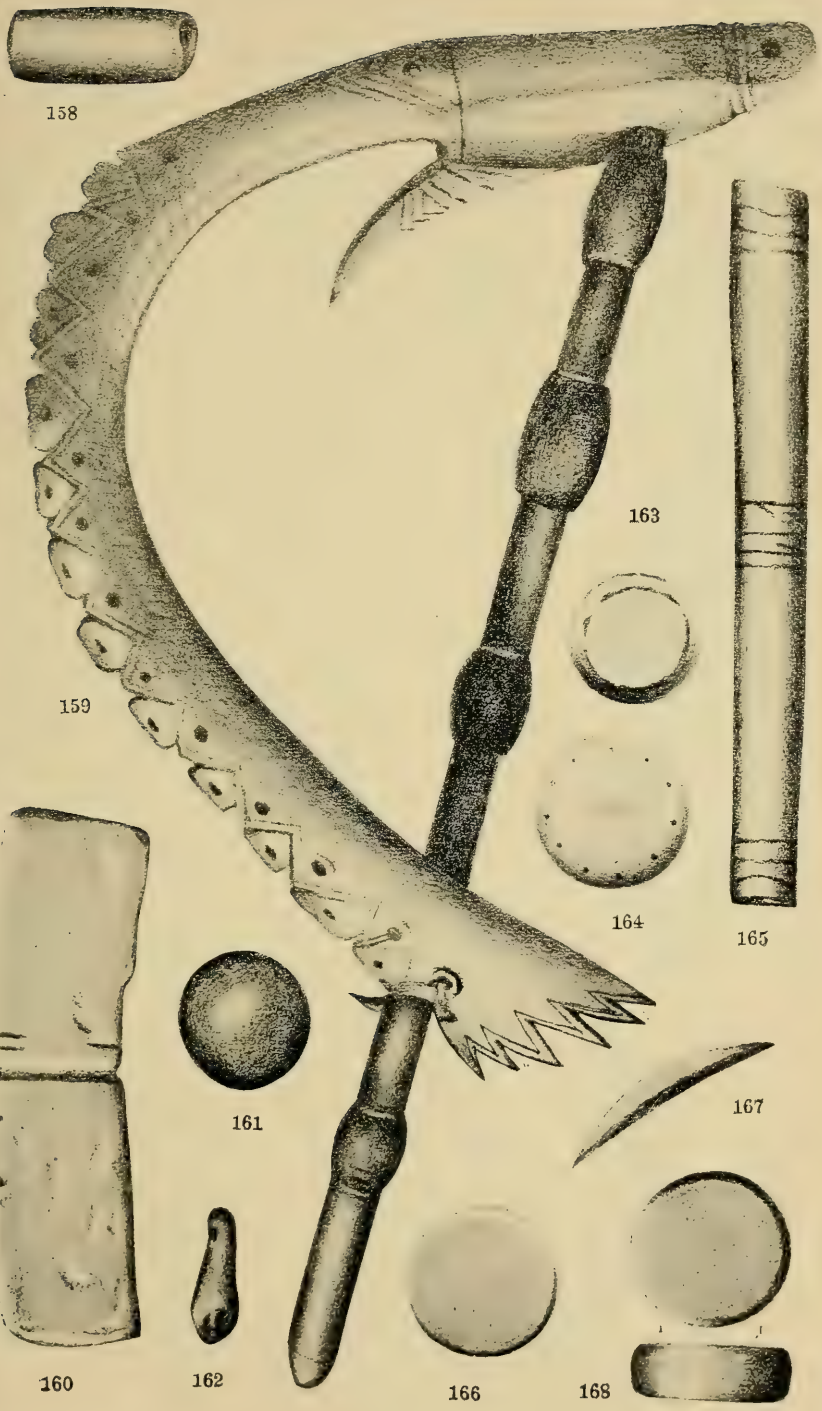
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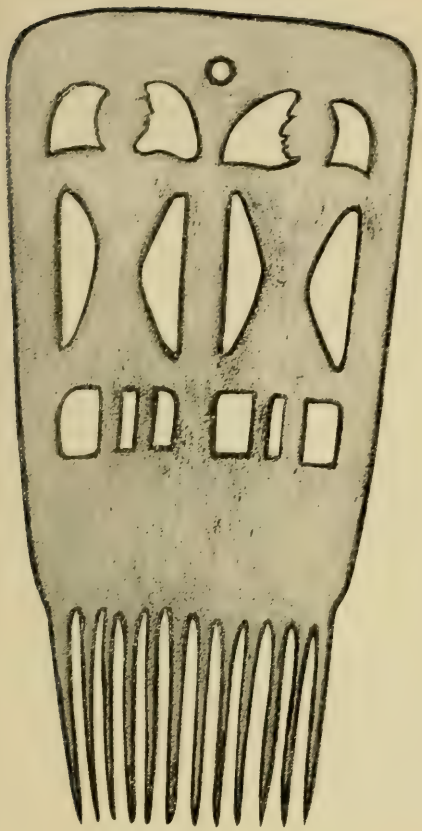

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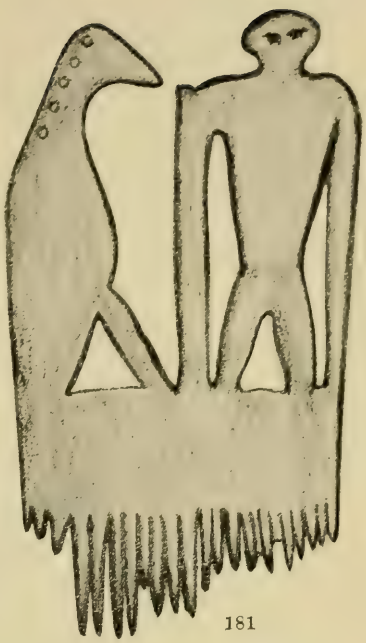

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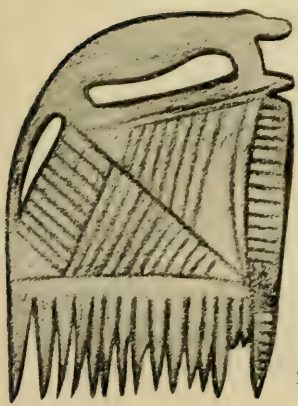

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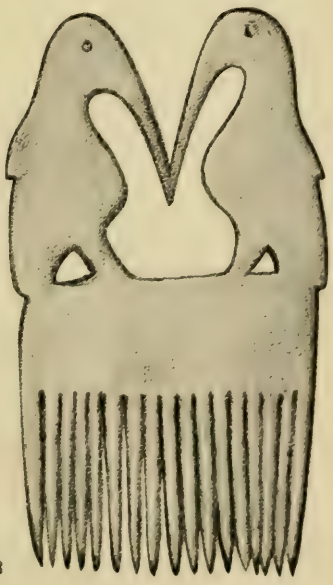

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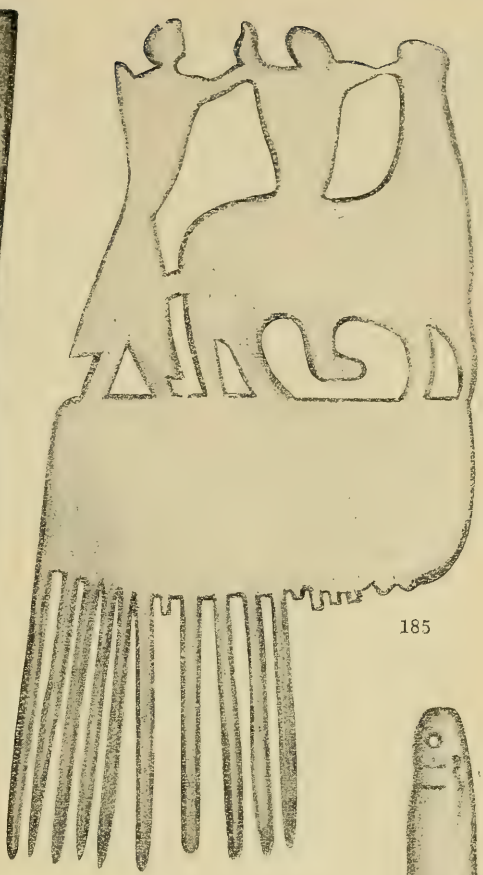

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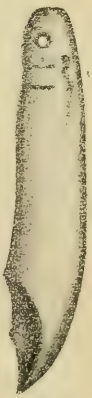

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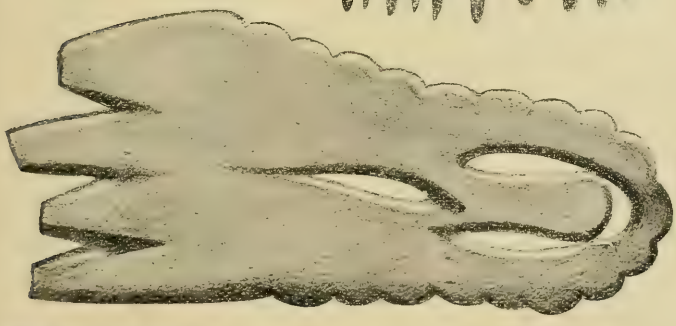

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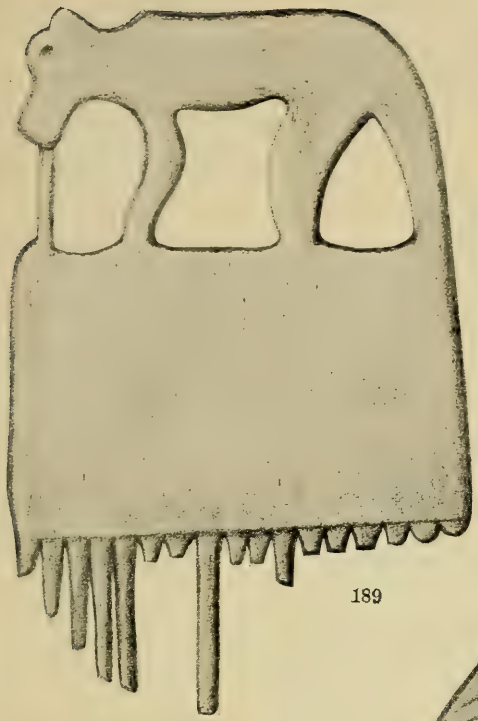

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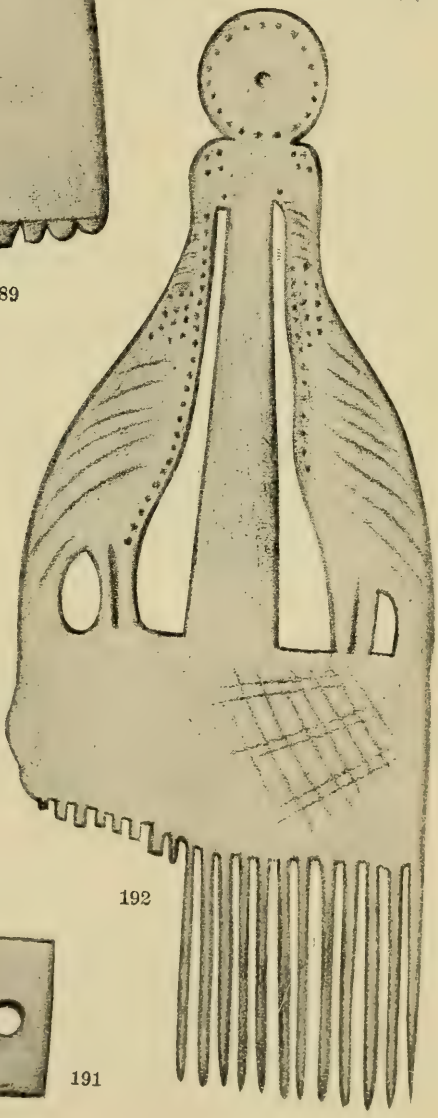

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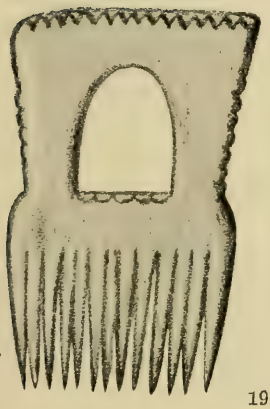

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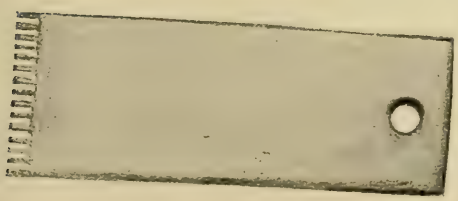

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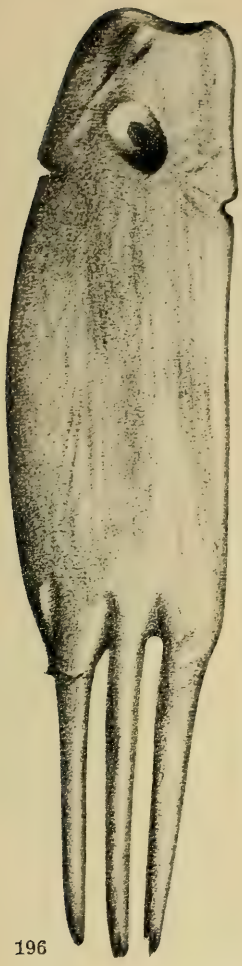

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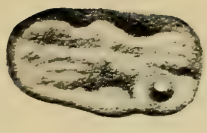

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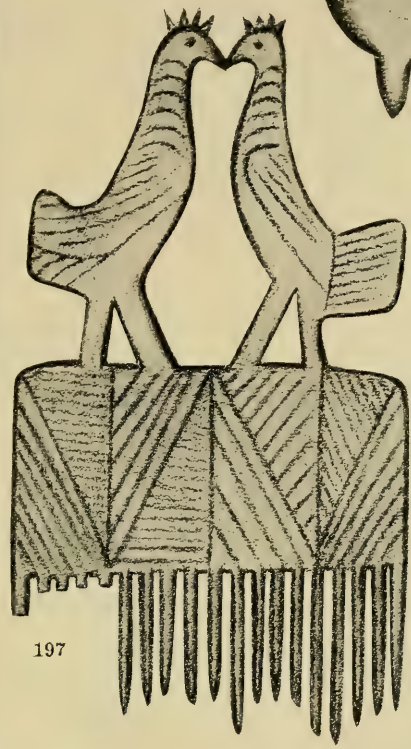

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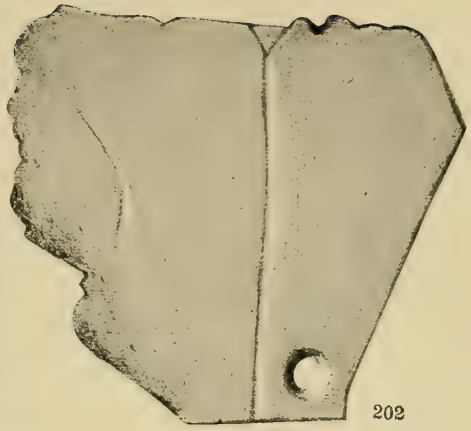

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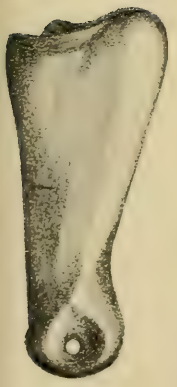

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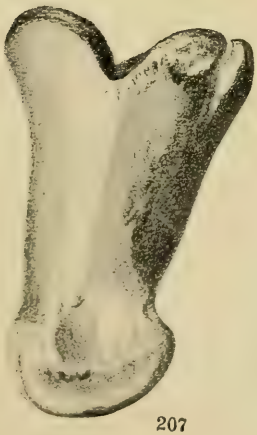

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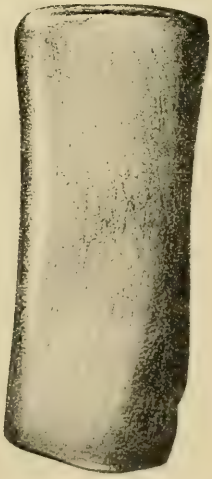

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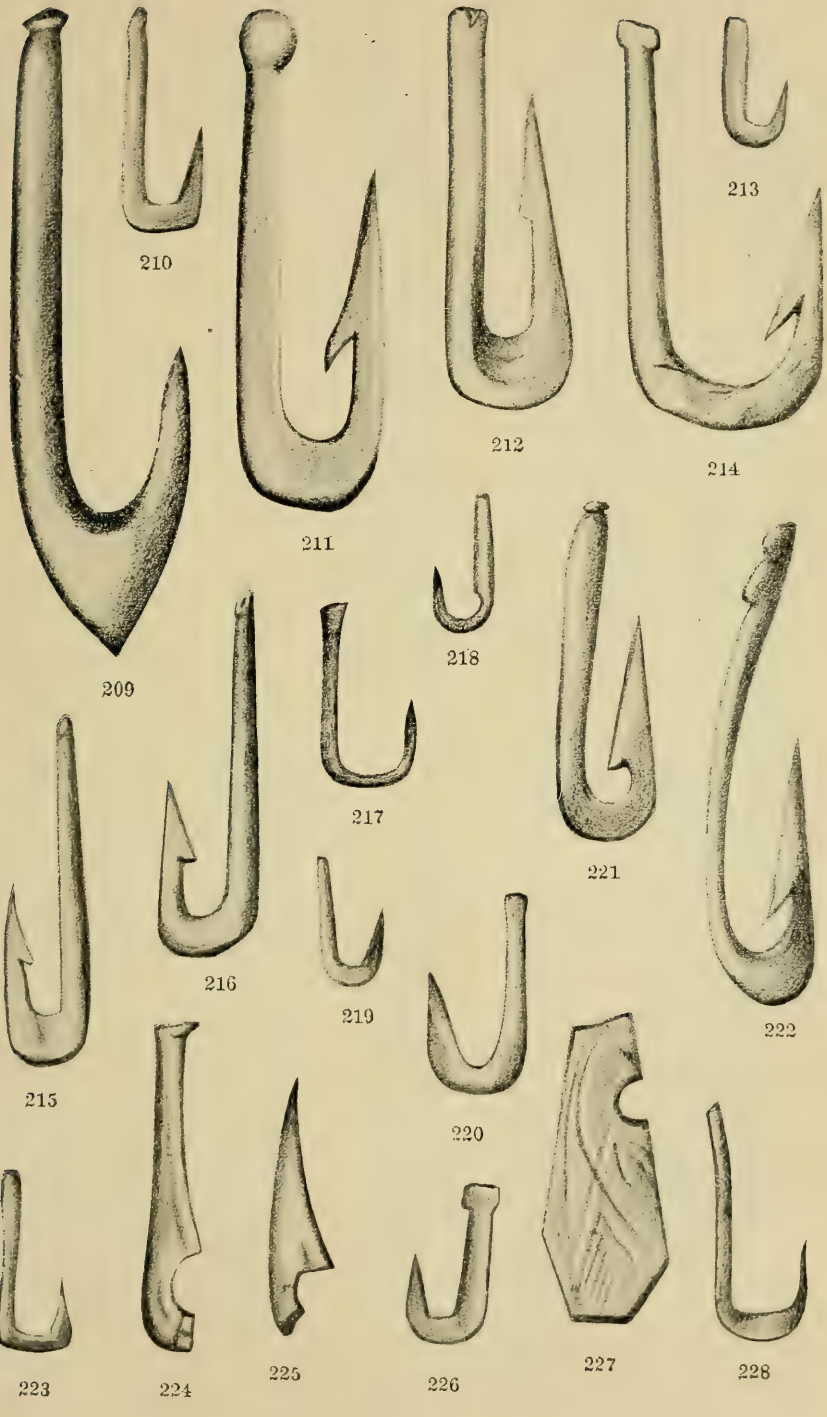
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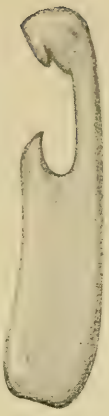

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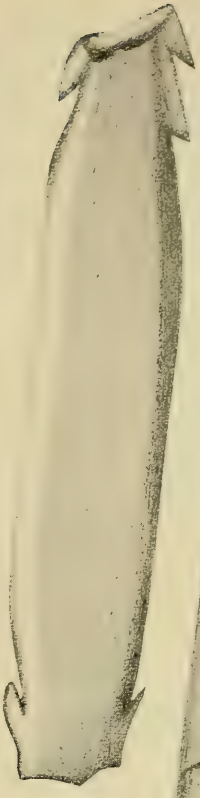

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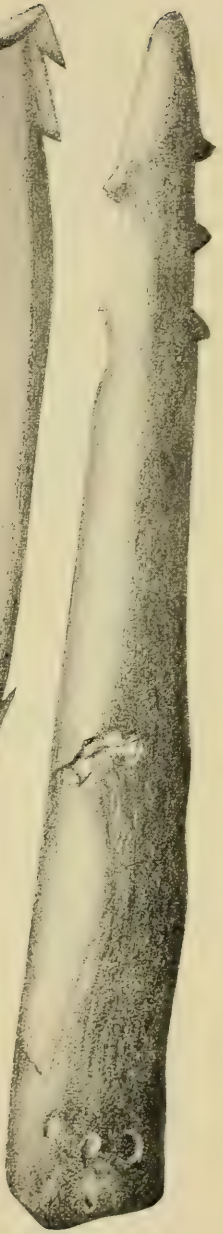

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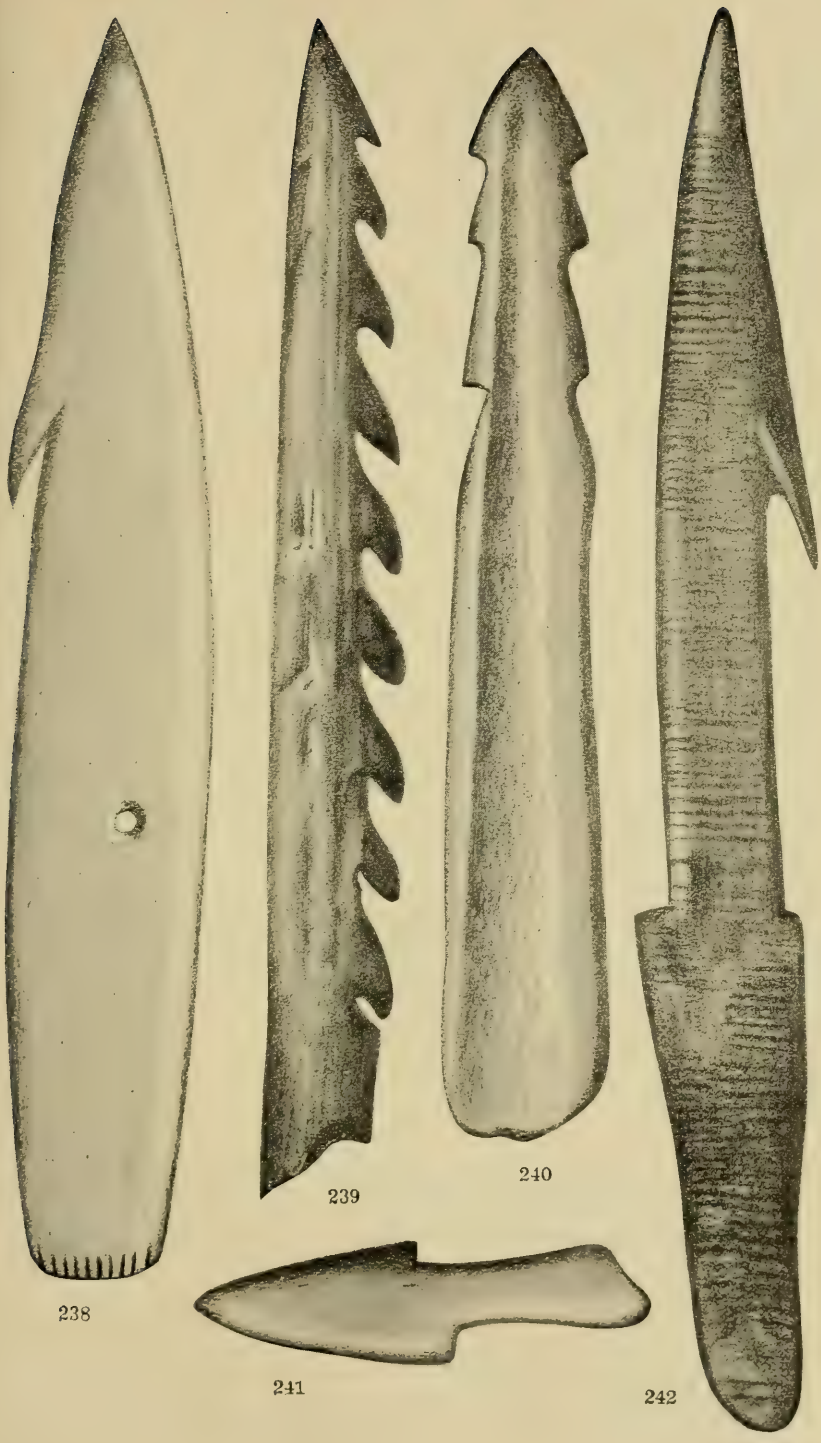

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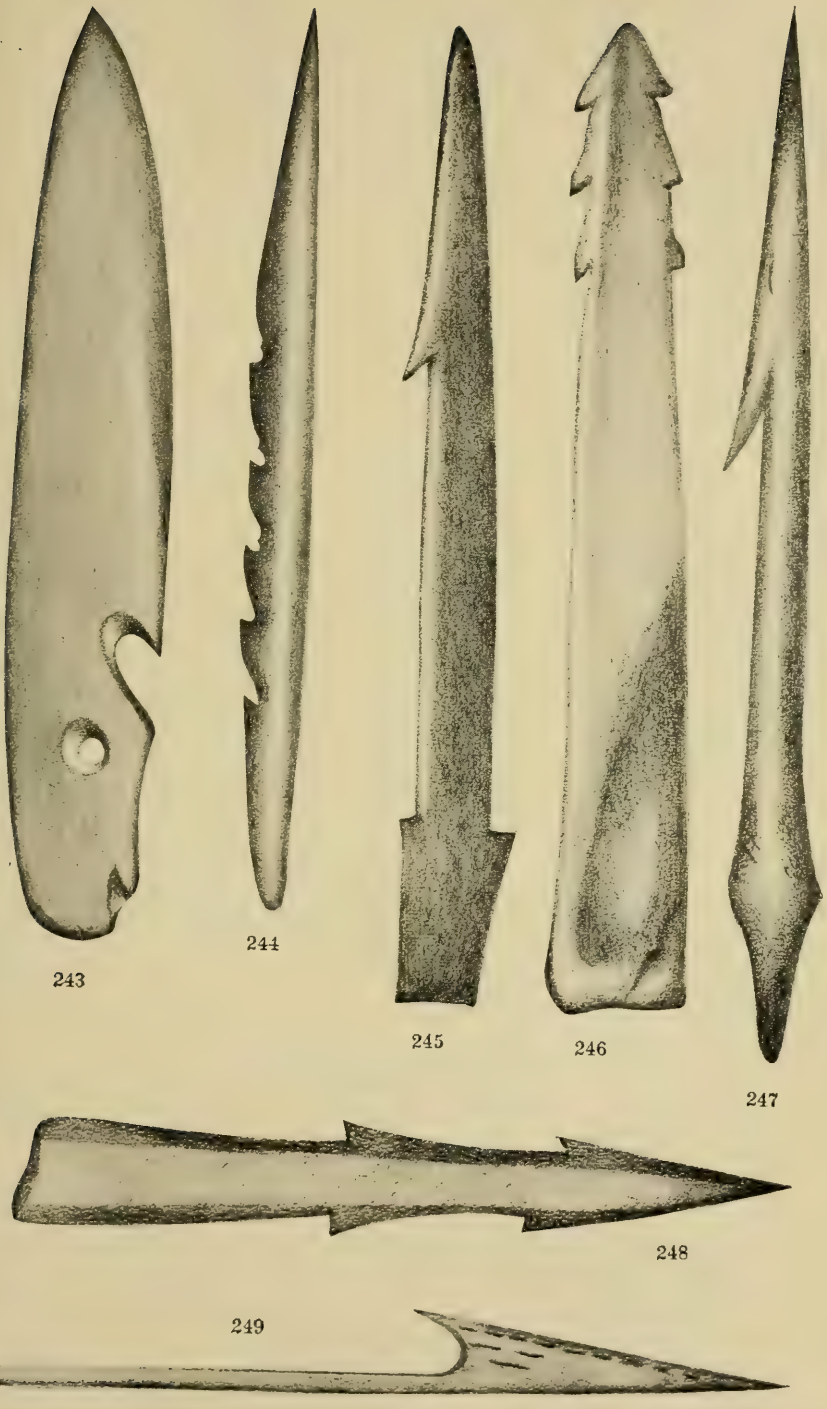

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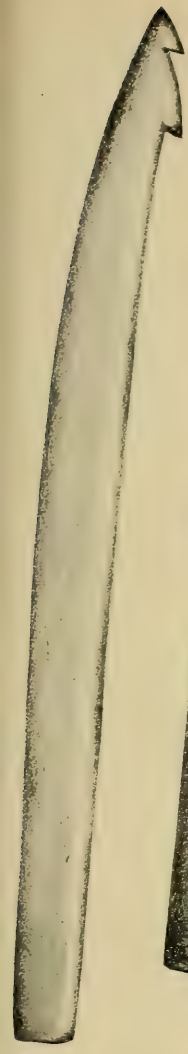

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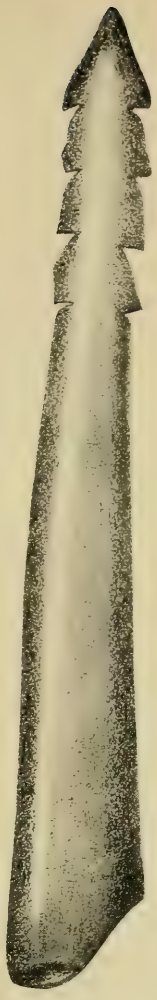

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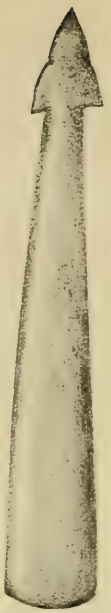

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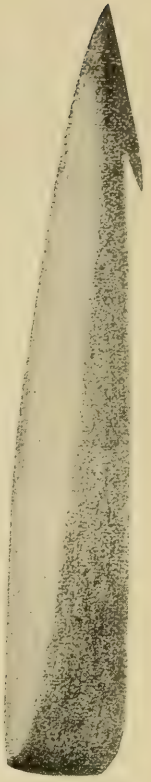

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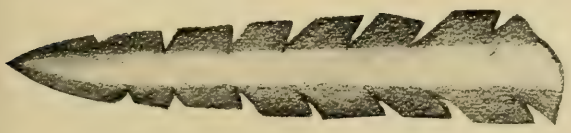

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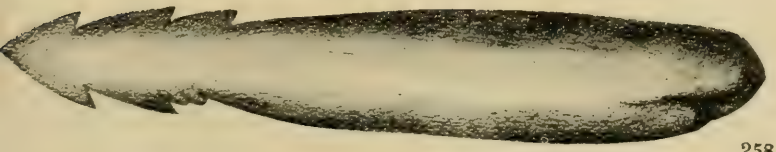

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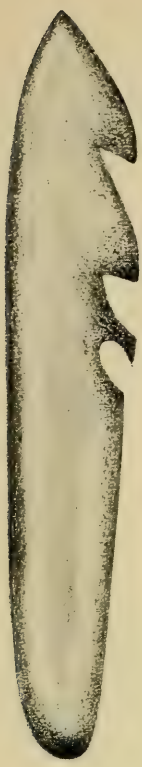

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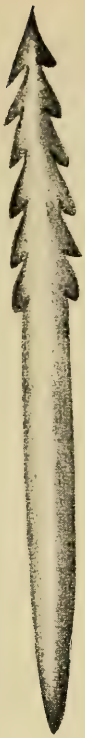

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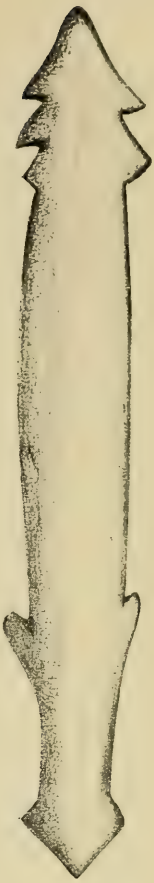

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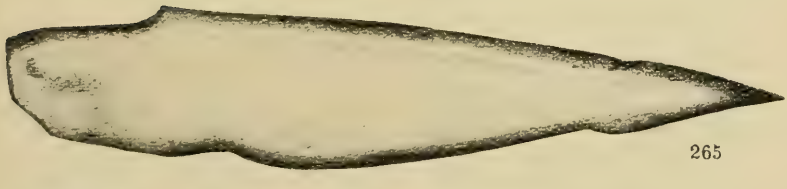

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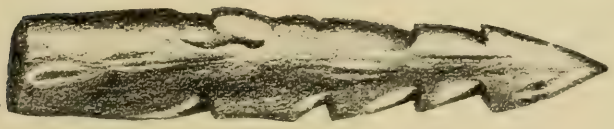

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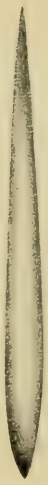

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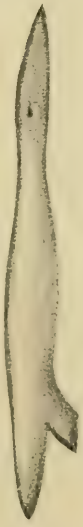

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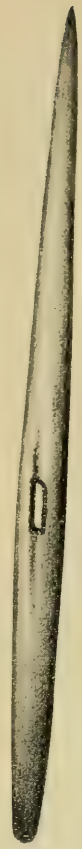

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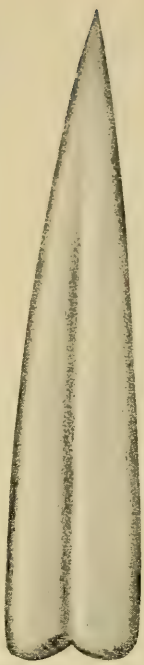

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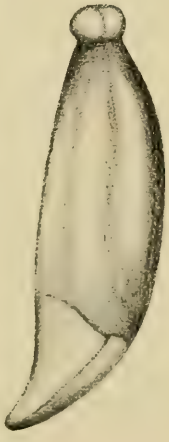

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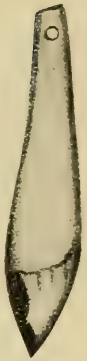

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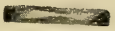

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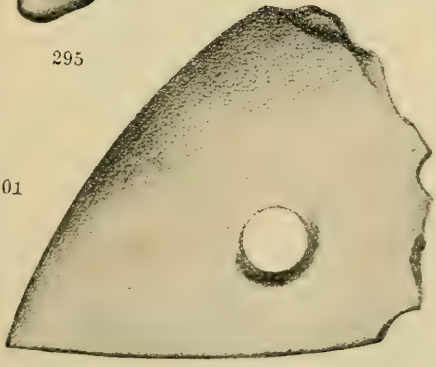

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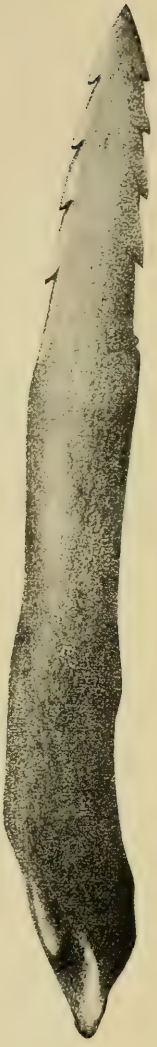

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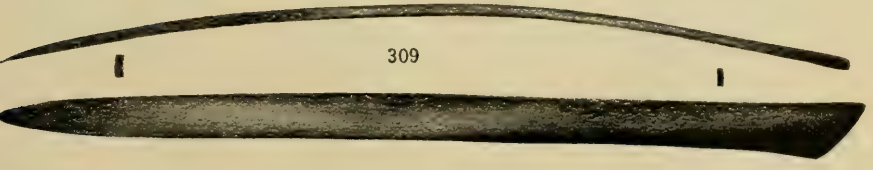

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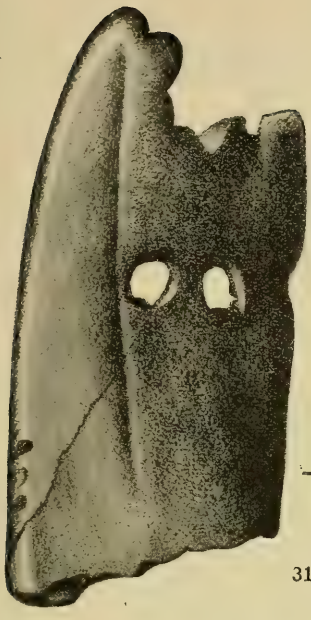

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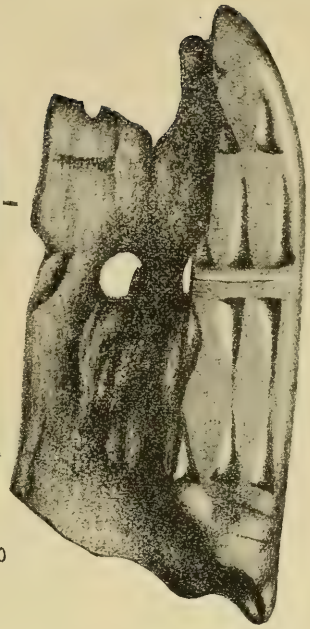

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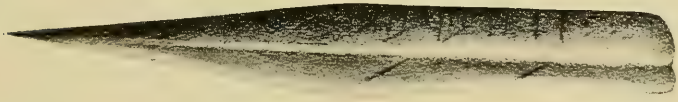

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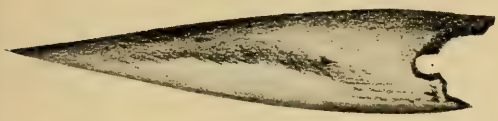

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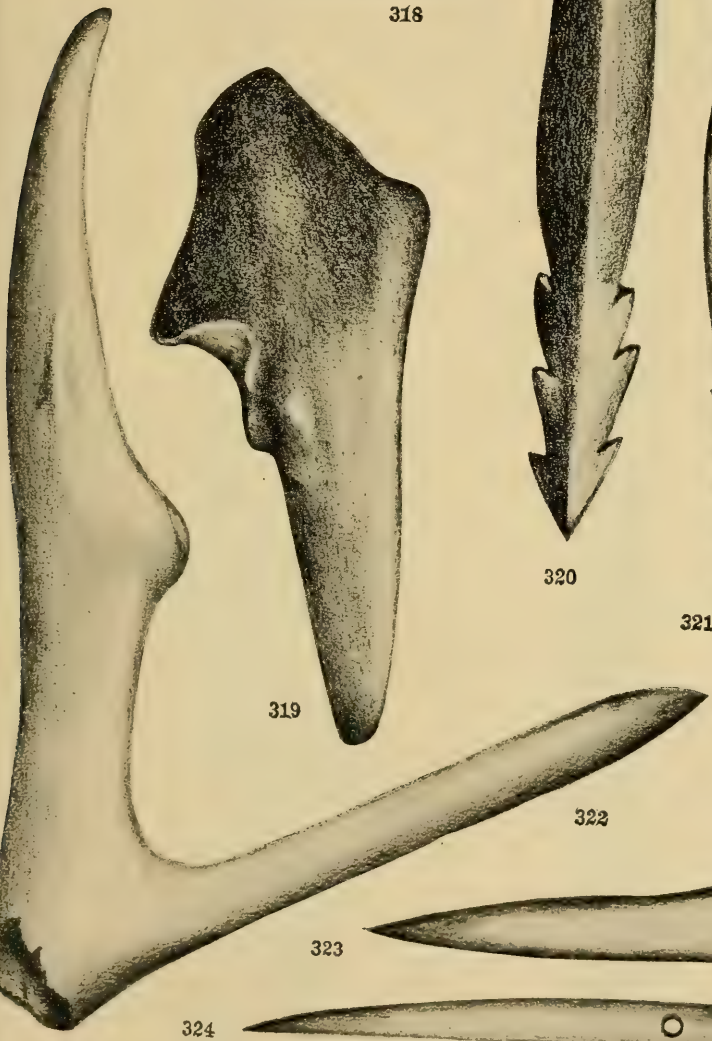

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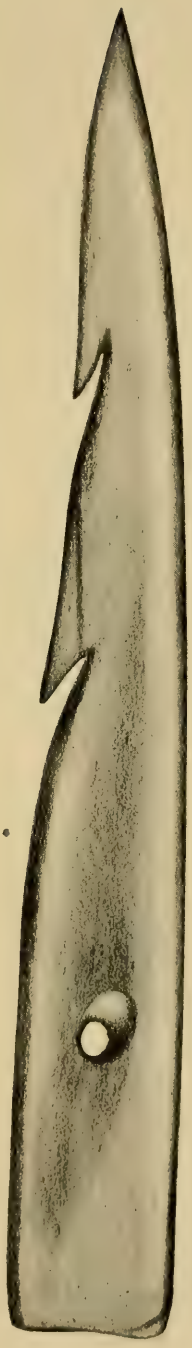

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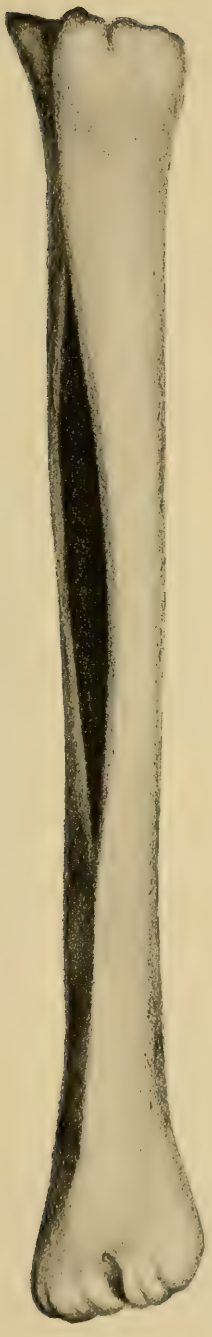

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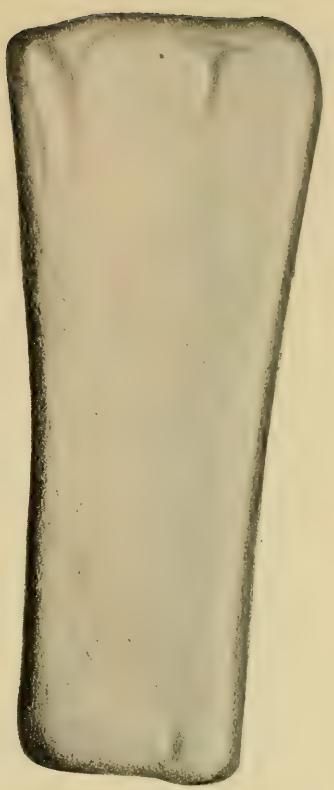

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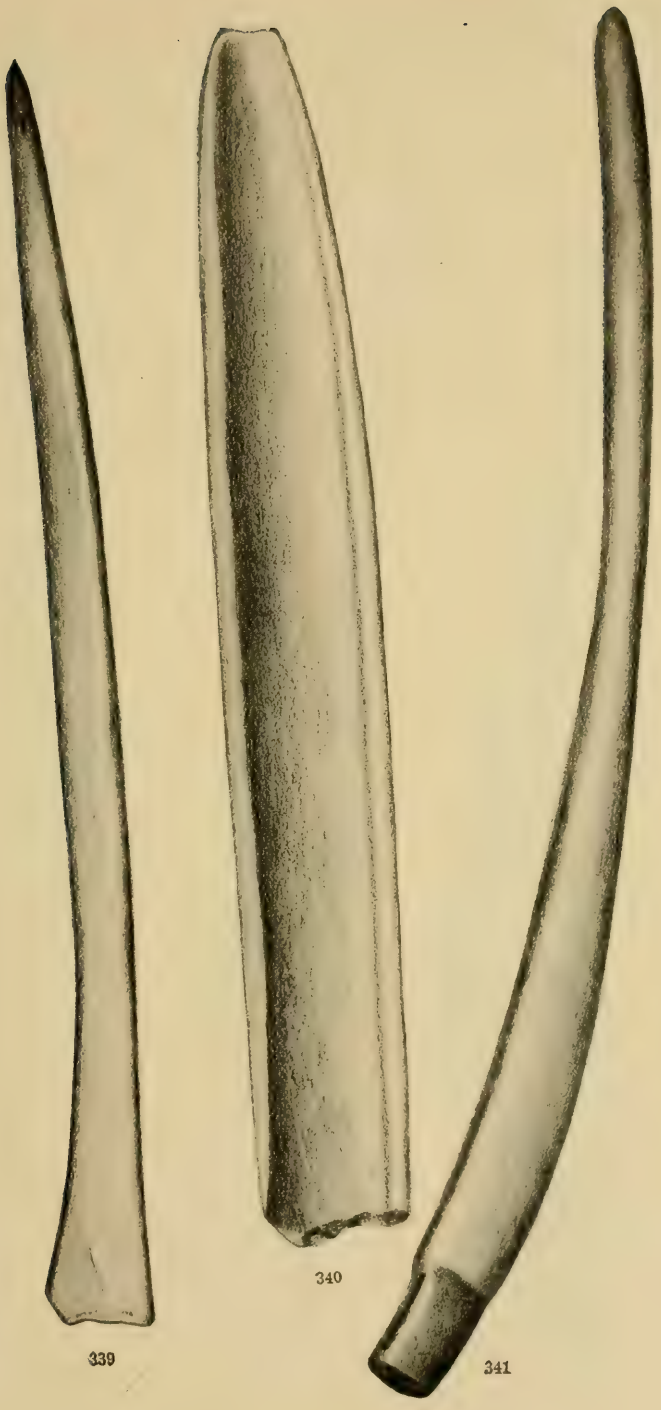

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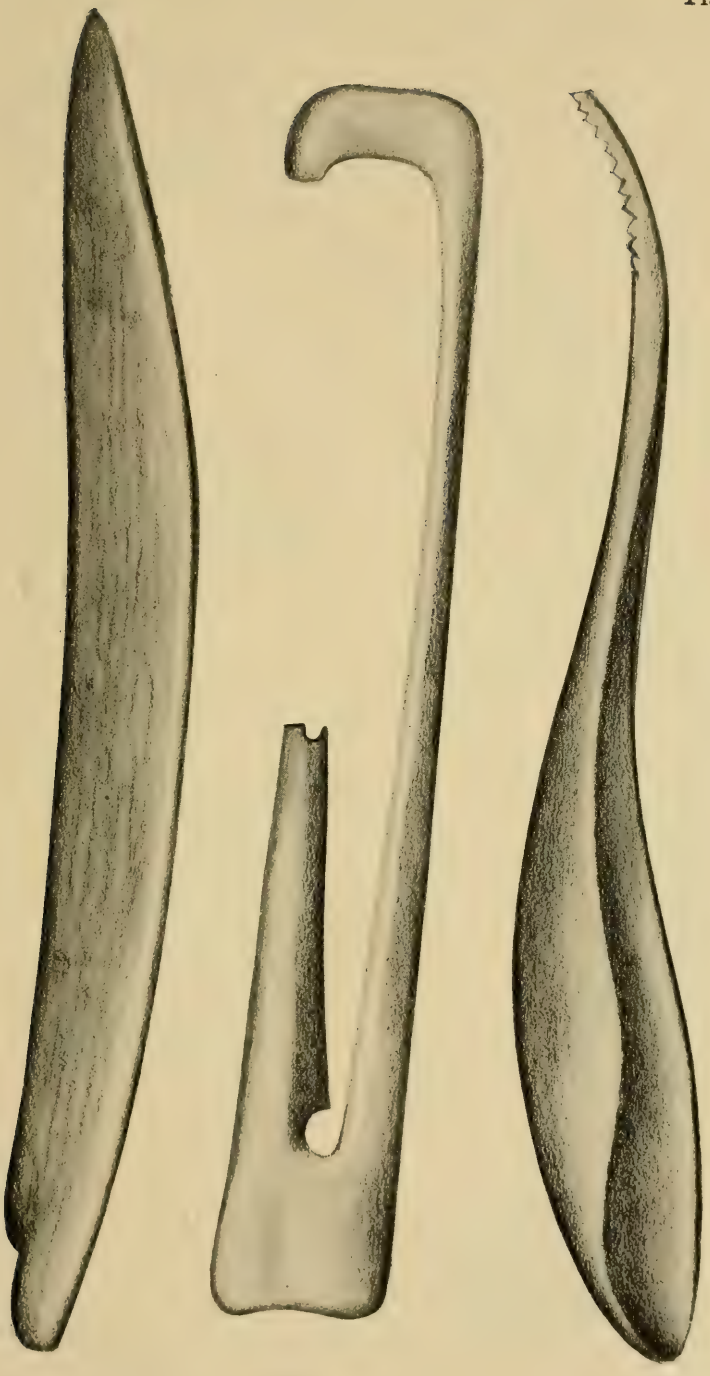

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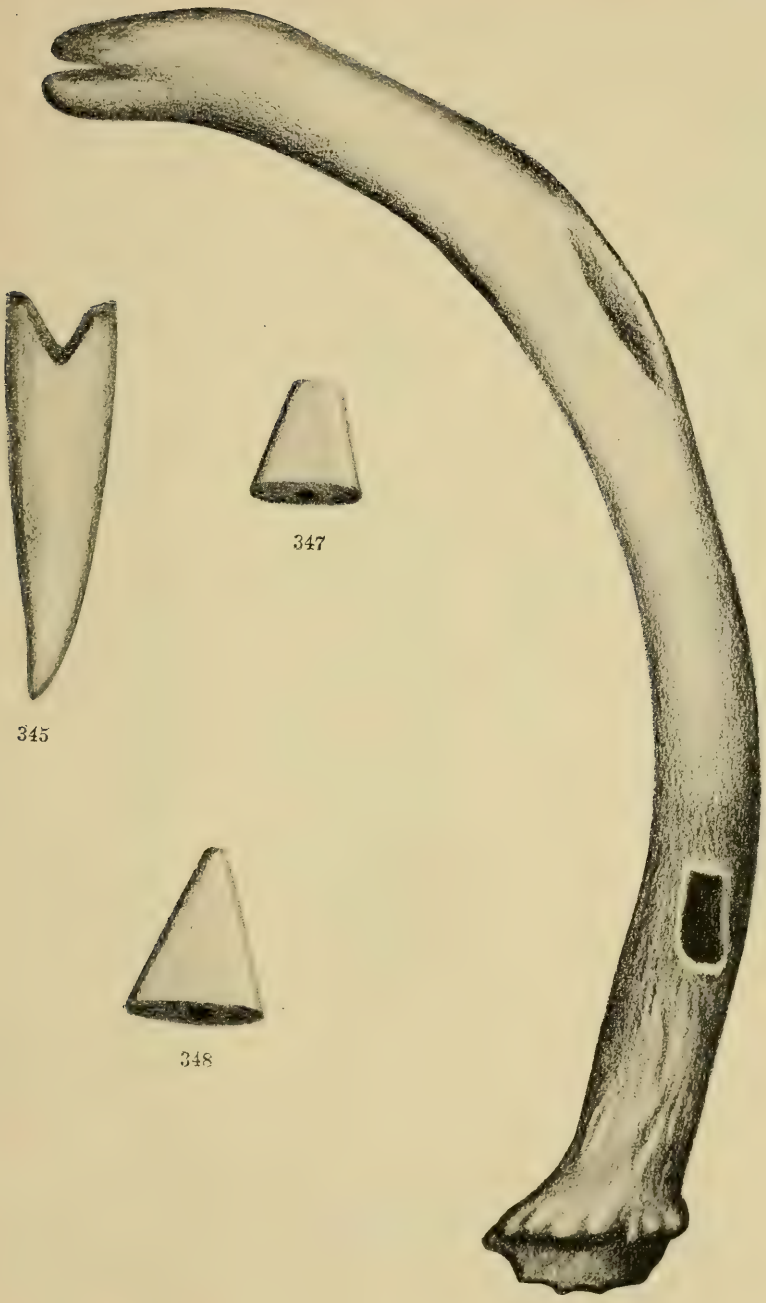

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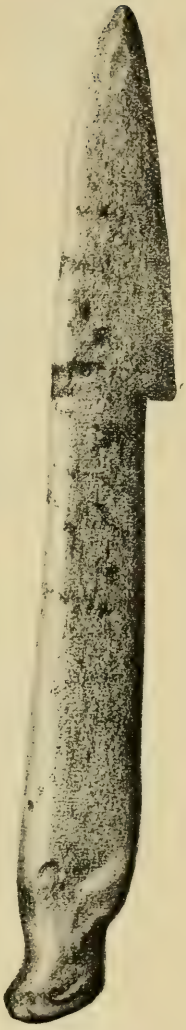

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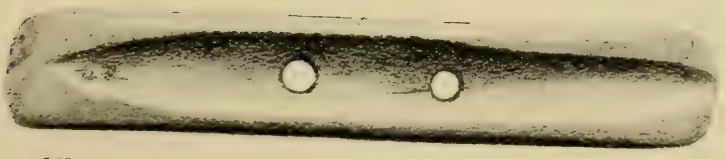

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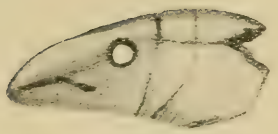

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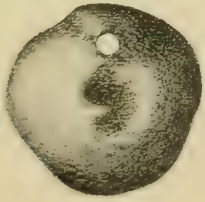

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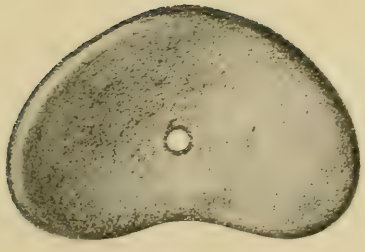

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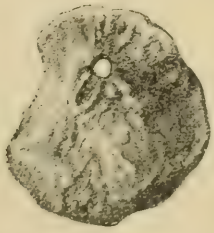

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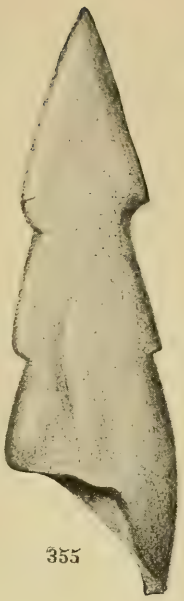

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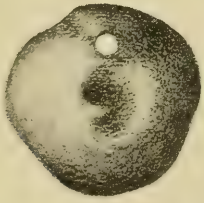

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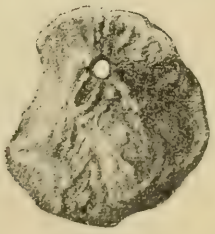

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—— Geologic Map of New York. 1901. *$3. Mounted on rollers $5.*

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